3Com® EtherLink®

EtherLink PCI Network Interface Cards

User Guide

MODEL NOS.
3C905C-TX-M
3C905B
3C900B

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EtherLink® PCI Network Interface Cards User Guide

3C905C-TX-M For Complete PC Management
3C905B
3C900B

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Part No. 09-1743-000
Published June 1999

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CONTENTS

ABOUT THIS GUIDE

Conventions 10

Year 2000 Compliance 10

1 INTRODUCTION

Overview 11

3C905C-TX-M 11

3C905B 13

- 3C905B-TX 13
- 3C905B-COMBO 14
- 3C905B-FX 14

3C900B 15

Remote Wake-Up 17

- Remote Wake-Up Cable 17
- Remote Wake-Up Requirements 17
  - 3C905C-TX-M NIC 18
  - 3C905B and 3C900B-FL NICs 18
- Multiple NIC Installations and Remote Wake-Up 18

Managed PC Boot Agent (MBA) Software 18

Desktop Management Interface (DMI) 2.0 19

Dynamic*Access* LAN Agent 19

Remote System Alerts 20

2 INSTALLING AND CONNECTING THE NIC

Overview 21

- Meeting PC Requirements 21
- Installation Steps 21
- Installing Multiple NICs 22
- Upgrading Windows 95 to Windows 98 22
- Updating the Network Driver and NIC Software 22
- Installing a 3C900 or 3C905 NIC 22

Downloaded from www.Manualslib.com manuals search engine

Installing From Diskette 22
Running the Preinstallation Program 24
Inserting the NIC in the PC 25
Connecting the Remote Wake-Up Cable 28
Connecting the NIC to the Network 29
RJ-45 Port 29
BNC Port 31
AUI Port 32
SC Port 33
ST Port 34

3 INSTALLING NIC SOFTWARE IN WINDOWS
Overview 37
Installing the Network Driver Using the EtherCD 37
Windows 95 38
Windows 98 39
Windows NT 4.0 41
Windows NT 3.51 42
Verifying Successful Installation 43
Windows 95 and Windows 98 43
Windows NT 4.0 43
Windows NT 3.51 43
Installing the 3Com NIC Diagnostics Program 44
Updating the Network Driver and NIC Software 45
Installing Multiple NICs 45
Windows 95 and Windows 98 46
Windows NT 4.0 47

4 INSTALLING THE NETWARE CLIENT AND SERVER DRIVERS
Overview 49
Installing the NetWare Client Driver 49
About 3Com Intelligent Auto Install Software 49
Intelligent Auto Install Requirements 50
Running the Intelligent Auto Install Software 50
Installing the NetWare Server Driver 51
Obtaining NetWare Loadable Modules 51
NetWare 3.12 52

Downloaded from www.Manualslib.com manuals search engine

NetWare 4.x 52
Importing the Server Driver 52
Loading the Driver Manually 53
NetWare 5.x 53
Importing the Server Driver 53
Loading the Driver Manually 54
Installing Multiple NICs 55
Verifying the PCI Slot Number 56

5 CONFIGURING THE NIC
Overview 57
Default NIC Settings 57
Configuration Methods 58
Changing General NIC Configuration Settings 59
Configuring the Managed PC Boot Agent (MBA) 60
Enabling or Disabling the Boot ROM Setting 61
Booting From the Network 61
BBS BIOS-Compatible PCs 62
Non-BBS BIOS-Compatible PCs 63

6 TROUBLESHOOTING THE NIC
Overview 65
Accessing 3Com Support Databases 65
Accessing the 3Com Knowledgebase 65
Accessing the 3Com NIC Help System 66
Accessing Release Notes and Frequently Asked Questions 66
Troubleshooting the NIC Installation 67
Problems/Error Messages 67
Cleaning Up a Failed Installation 67
Troubleshooting the Network Connection 68
Troubleshooting Remote Wake-Up 69
Removing the Network Driver 70
Windows 95 and Windows 98 70
Windows NT 4.0 71
Windows NT 3.51 71
Removing the 3Com NIC Diagnostics Program 72

Downloaded from www.Manualslib.com manuals search engine

7 RUNNING NIC DIAGNOSTICS

Overview 73
Interpreting the LEDs 73
Running the NIC Diagnostics Tests 75
To Run the Network Test 75
To Run the NIC Test 76
To Run the Remote Wake-Up Test 76
Viewing Network Statistics 77
Using the 3Com Icon in the Windows System Tray 78

A SPECIFICATIONS AND CABLING REQUIREMENTS

3C905C-TX-M NIC Specifications 79
3C905B NICs Specifications 80
3C900B NICs Specifications 81
Cabling Requirements 82
Twisted-Pair Cable 82
10BASE-T Operation 83
100BASE-TX Operation 84
RJ-45 Connector Pin Assignments 84

B INSTALLING THE DYNAMIC*Access* LAN AGENT

Overview 85
Client PC Requirements 85
Installing the Dynamic*Access* LAN Agent 86
Verifying Successful Installation 87
Configuring the Dynamic*Access* LAN Agent 87
Removing Dynamic*Access* Technology 88

C INSTALLING THE 3COM DMI AGENT

Overview 89
About the 3Com DMI Agent 89
System Requirements 90
Client PC Requirements 90
Network Management Requirements 91
Installing the 3Com DMI Agent 91

Downloaded from www.Manualslib.com manuals search engine

D TECHNICAL SUPPORT
Online Technical Services 93
World Wide Web Site 93
3Com Knowledgebase Web Services 94
3Com FTP Site 94
3Com Bulletin Board Service 94
Access by Analog Modem 94
Access by Digital Modem 95
3Com Facts Automated Fax Service 95
Support from Your Network Supplier 95
Support from 3Com 96
Returning Products for Repair 97

INDEX

3COM CORPORATION LIMITED WARRANTY

FCC CLASS B STATEMENT

FCC DECLARATION OF CONFORMITY

INDUSTRY CANADA CLASS B EMISSION COMPLIANCE STATEMENT

AVIS DE CONFORMITÉ À LA RÉGLEMENTATION D'INDUSTRIE CANADA

VCCI CLASS B STATEMENT

3COM END USER SOFTWARE LICENSE AGREEMENT

PRODUCT REGISTRATION

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ABOUT THIS GUIDE

This guide describes how to install, configure, and troubleshoot the following 3Com® EtherLink® PCI network interface cards (NICs):

NIC	Model Number
EtherLink 10/100 PCI For Complete PC Management	3C905C-TX-M
EtherLink 10/100 PCI	3C905B-TX
	3C905B-TX-M
	3C905B-TX-NM
	3C905B-COMBO
EtherLink 100 PCI Fiber	3C905B-FX
EtherLink 10 PCI Fiber	3C900B-FL
EtherLink 10 PCI	3C900B-TPO
	3C900B-COMBO

This guide is intended for those who install and configure Ethernet NICs. Some familiarity with Ethernet networks and NICs is assumed.

If release notes are shipped with your product and the information there differs from the information in this guide, follow the instructions in the release notes.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or HTML on the 3Com World Wide Web site:

http://www.3com.com/

You can download Acrobat Reader from the *EtherCD* or from Adobe Systems Incorporated Web site:

http://www.adobe.com/

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Conventions

The following tables list conventions that are used throughout this guide.

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device
	Warning	Information that alerts you to potential personal injury

Convention	Description
`Screen displays`	This typeface represents information as it appears on the screen.
`Commands`	The word "command" means that you must enter the command exactly as shown and then press Return or Enter. Commands appear in bold. Example: To launch the DOS diagnostics program, enter the following command: **`a: install`**
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press Return or Enter. Do not press Return or Enter when an instruction simply says "type."
Words in *italics*	Italics are used to: ■ Emphasize a point. ■ Denote a new term at the place where it is defined in the text. ■ Identify menu names, menu commands, and software button names. Examples: From the *Help* menu, select *Contents*. Click *OK*.

Year 2000 Compliance

For information on Year 2000 compliance and 3Com products, visit the 3Com Year 2000 Web page:

`http://www.3com.com/products/yr2000.html`

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1 INTRODUCTION

Overview

This chapter describes the following 3Com® EtherLink® PCI network interface cards (NICs):

NIC	Model Number
EtherLink 10/100 PCI For Complete PC Management	3C905C-TX-M
EtherLink 10/100 PCI	3C905B 3C905B-TX-M 3C905B-TX-NM 3C905B-COMBO
EtherLink 100 PCI Fiber	3C905B-FX
EtherLink 10 PCI Fiber	3C900B-FL
EtherLink 10 PCI	3C900B-TPO 3C900B-COMBO

Unless specifically indicated, information in this user guide refers to all NIC models.

3C905C-TX-M

The 3C905C-TX-M NIC connects your PCI-compliant PC to either a 10 Mbps Ethernet network or a 100 Mbps Fast Ethernet network.

The 3C905C-TX-M NIC supports a suite of Dynamic*Access*® Technology features for desktop and network management, including:

- Remote Wake-Up
- Managed PC Boot Agent (MBA) Software
- DynamicAccess LAN Agent for traffic prioritization and remote monitoring (RMON and RMON2)

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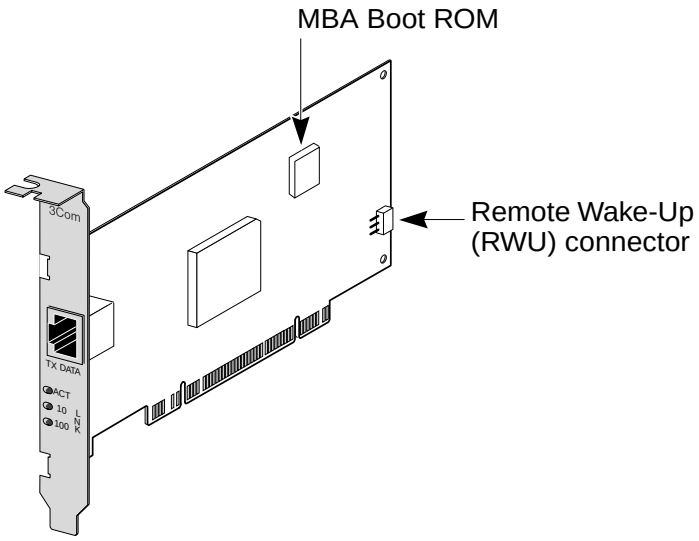
- Desktop Management Interface (DMI) 2.0
- Remote System Alerts (heartbeat packets)



The following table describes the features of the 3C905C-TX-M NIC.

Features Supported	3C905C-TX-M NIC
■ RJ-45 connector for 10BASE-T or 100BASE-TX	✔
■ Remote Wake-Up	✔
■ DMI 2.0	✔
■ Integrated boot ROM with Managed PC Boot Agent (MBA) software	✔
■ Traffic prioritization	✔
■ Remote monitoring (RMON and RMON2)	✔
■ Efficient multicast control	✔
■ Remote system alerts (heartbeat packets)	✔

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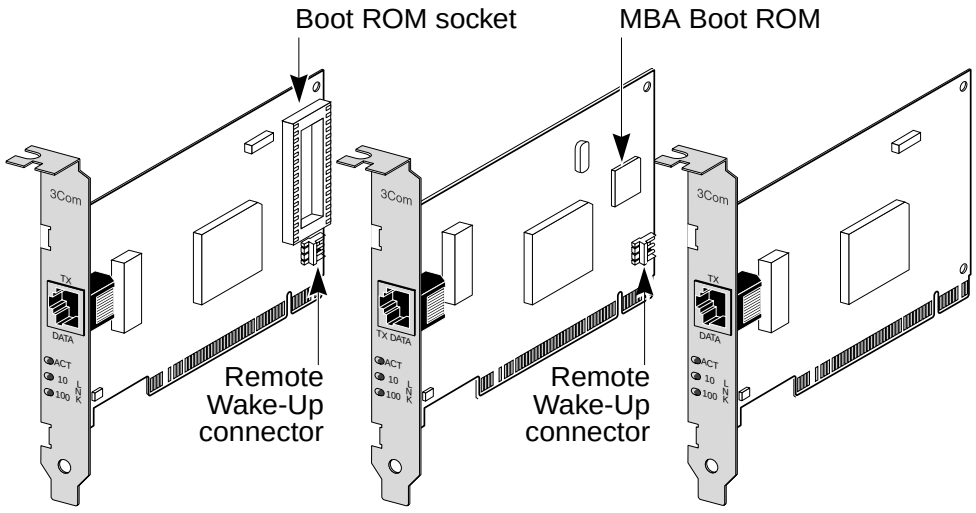
3C905B

The 3C905B NICs connect your PCI-compliant PC to either a 10 Mbps Ethernet network or a 100 Mbps Fast Ethernet network.

The 3C905B NICs support a suite of Dynamic*Access* Technology features for desktop and network management, including:

- Remote Wake-Up
- Managed PC Boot Agent (MBA) Software (3C905B-TX-M only)
- DynamicAccess LAN Agent for traffic prioritization and remote monitoring (RMON and RMON2)
- Desktop Management Interface (DMI) 2.0

3C905B-TX



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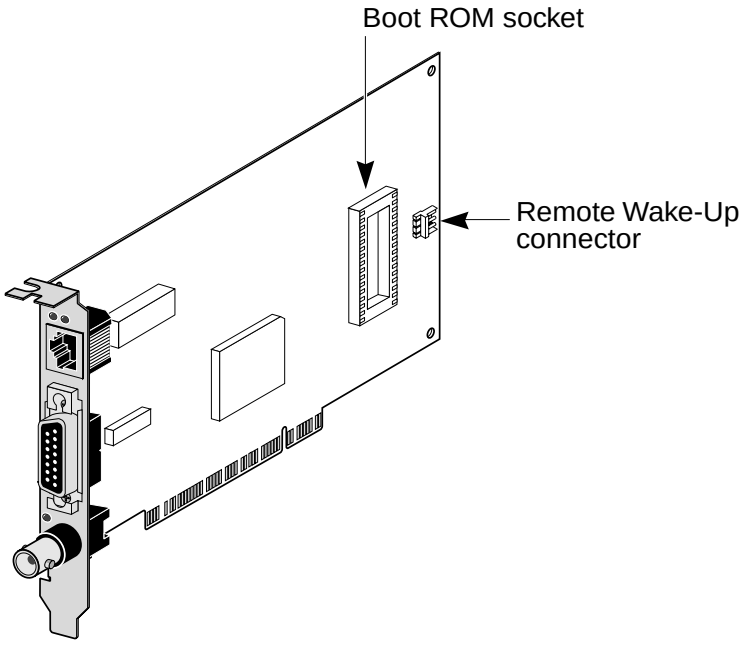
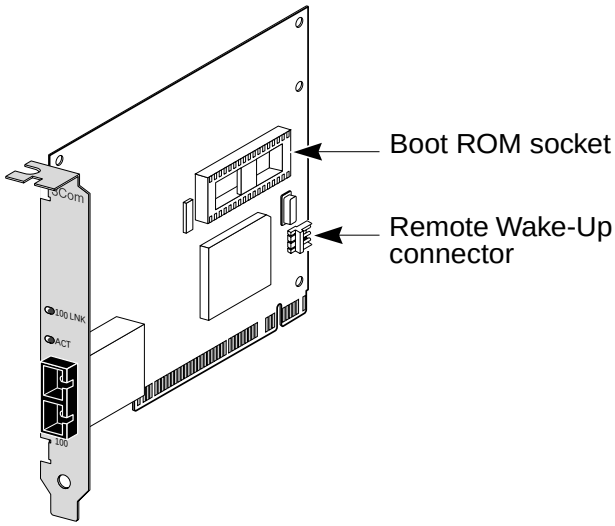
3C905B-COMBO



3C905B-FX



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The following table describes the features of the 3C905B NICs.

	3C905B NIC Model				
Features Supported	**-TX**	**-TX-M**	**-TX-NM**	**-COMBO**	**-FX**
■ RJ-45 connector for 10BASE-T or 100BASE-TX	✔	✔	✔	✔	
■ AUI and BNC connectors for 10BASE5 and 10BASE2				✔	
■ SC connector for 100BASE-FX					✔
■ Remote Wake-Up	✔	✔		✔	✔
■ DMI 2.0	✔	✔	✔	✔	✔
■ Boot ROM socket	✔			✔	✔
■ Integrated boot ROM with Managed PC Boot Agent (MBA) software*		✔			
■ Traffic prioritization	✔	✔	✔	✔	✔
■ Remote monitoring (RMON and RMON2)	✔	✔	✔	✔	✔
■ Efficient multicast control	✔	✔	✔	✔	✔

* A boot ROM with MBA software can be purchased separately for use with the 3C905B-TX, 3C905B-COMBO, and 3C905B-FX NICs.

3C900B

The 3C900B NICs connect your PCI-compliant PC to a 10 Mbps Ethernet network.

The 3C900B NICs support the following Dynamic*Access* Technology features for desktop and network management:

- Remote Wake-Up (3C900B-FL only)
- DynamicAccess LAN Agent for traffic prioritization and remote monitoring (RMON and RMON2)
- Desktop Management Interface (DMI) 2.0

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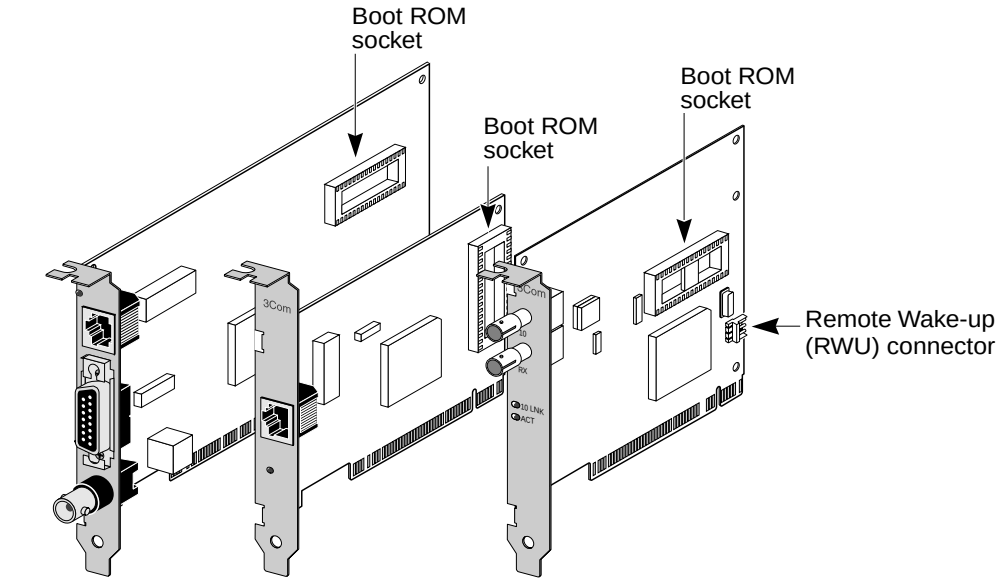

The following table describes the features of the 3C900B NICs.

	3C900B NIC Model		
Features Supported	**-COMBO**	**-TPO**	**-FL**
■ RJ-45 connector for 10BASE-T (10 Mbps only)	✔	✔	
■ BNC connector for 10BASE2 (10 Mbps only)	✔		
■ AUI connector for 10BASE5 (10 Mbps only)	✔		
■ ST connector for 10BASE-FL			✔
■ Remote Wake-Up			✔
■ DMI 2.0	✔	✔	✔
■ Boot ROM socket*	✔	✔	✔
■ Traffic prioritization	✔	✔	✔
■ Remote monitoring (RMON and RMON2)	✔	✔	✔
■ Efficient multicast control	✔	✔	✔

* A boot ROM with Managed PC Boot Agent (MBA) software can be purchased separately for installation and use with the 3C900B NICs. See "Managed PC Boot Agent (MBA) Software" later in this chapter for more information.

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Remote Wake-Up

Remote Wake-Up is the ability to remotely power-on a PC for after-hours administration.

Remote Wake-Up support is enabled by connecting a Remote Wake-Up cable from the NIC's Remote Wake-Up (RWU) connector to a 3-pin Remote Wake-Up connector on the PC motherboard. See "Connecting the Remote Wake-Up Cable" in Chapter 2 for instructions.

For 3C905C-TX-M NICs, if your PC is compliant with PCI 2.2, Remote Wake-Up is automatically enabled through the PCI bus. The Remote Wake-Up cable is not required. (See your PC documentation if you are unsure whether your PC is compliant with PCI 2.2.)

Remote Wake-Up Cable

A Remote Wake-Up cable is shipped with each NIC that supports this feature.

To order additional Remote Wake-Up cables, contact 3Com:

- Toll-free number for the United States and Canada:
  1-877-226-4604
- Toll number for international calls:
  1-510-226-4604

Remote Wake-Up Requirements

The following NICs support Remote Wake-Up:

- 3C905C-TX-M
- 3C905B-TX
- 3C905B-TX-M
- 3C905B-COMBO
- 3C905B-FX
- 3C900B-FL

Your PC or server must have a management application that supports Remote Wake-Up. In addition, the following items ar required to use Remote Wake-Up.

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3C905C-TX-M NIC

- BIOS that supports Remote Wake-Up
- PCI 2.2-compliant bus or a 3-pin Remote Wake-Up connector on the PC motherboard and a 5-volt standby power supply unit rated at a minimum of 375 milliamperes

3C905B and 3C900B-FL NICs

- BIOS that supports Remote Wake-Up
- 3-pin Remote Wake-Up connector on the PC motherboard
- 5-volt standby power supply unit rated at a minimum of 375 milliamperes

If you are unsure whether your PC meets the requirements listed above, refer to your PC documentation or contact your PC manufacturer.

For more information on Remote Wake-Up, including a list of PCs that currently support this feature, go to:

http://www.3com.com/partners/acpi

Multiple NIC Installations and Remote Wake-Up

To use multiple NICs as Remote Wake-Up NICs in the same PC, the PC must have a power supply that can support multiple Remote Wake-Up devices.

See your PC documentation if you are unsure whether your PC power supply can accommodate more than one Remote Wake-Up device.

Managed PC Boot Agent (MBA) Software

The Managed PC Boot Agent (MBA) software adds management capabilities to the NIC by enabling the PC to boot from the server, rather than from its local drive.

This preboot support allows you to use management applications to remotely:

- Install and configure a new PC that has never been connected to the network.
- Upgrade software.

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- Configure or reconfigure multiple systems simultaneously.
- Scan for viruses.
- Back-up hard drives and perform disaster recovery tasks.

For information on configuring the MBA to boot from the network, see "Configuring the Managed PC Boot Agent (MBA)" in Chapter 5.

For detailed information on the MBA, see the *Managed PC Boot Agent User Guide*, located with the MBA software on the *EtherCD*.

Desktop Management Interface (DMI) 2.0

DMI 2.0 enables managed PCs and net PCs to report details about themselves and their peripheral devices across the network to a DMI 2.0-compliant management application.

A network administrator can then use this information to configure and manage a client or server PC remotely.

For instructions on installing the 3Com DMI Agent, see Appendix C, "Installing the 3Com DMI Agent."

For more detailed information on DMI, see the *3Com DMI Agent User Guide* located with the 3Com DMI Agent software on the *EtherCD*. Information is also available at:

http://www.3com.com/managedpc

Dynamic*Access* LAN Agent

The Dynamic*Access* LAN agent is advanced network software that improves performance, management, and control of your network.

The Dynamic*Access* LAN agent enables the following features:

- RMON SmartAgents — Enables full RMON reporting on all network segments, including switched networks, without the need to place dedicated RMON probes throughout the network. RMON SmartAgents are for use with the Dynamic*Access* network edge monitor or other remote monitoring applications.

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- Traffic prioritization (IEEE 802.1p/Q) — Ensures that business-critical and delay-sensitive traffic (such as multimedia applications) has priority over normal data.
- Fast IP — Eliminates router bottlenecks and improves performance in switched networks.
- Efficient multicast control — Prevents flooding of switched networks by multicast applications such as video training, stock quotes, or online news.

The Dynamic*Access* LAN agent can be installed on a PC running Windows 95, Windows 98, or Windows NT. See Appendix B, "Installing the DynamicAccess LAN Agent," for more information.

For detailed information on the Dynamic*Access* LAN agent, see the *Dynamic*Access *Technology User Guide* located on the *EtherCD*. Information is also available at:

http://www.3com.com/dynamicaccess

Remote System Alerts

The 3C905C-TX-M NIC can be configured to continuously transmit a packet to an alert target management station. If the management station fails to receive the regularly scheduled packet, an alert can be triggered that signals a possible PC power loss or theft.

The 3C905C-TX-M NIC can also transmit a workgroup keep-alive packet periodically while the PC is in a sleep state. This packet prevents the PC's workstation address from being aged-out of switch and router tables.

Only system administrators should configure these features. See the ADVCONFG.TXT file located in the HELP directory on the EtherCD *for more information.*

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2 INSTALLING AND CONNECTING THE NIC

Overview

This chapter describes how to install the NIC in your PC and connect it to an Ethernet or Fast Ethernet network.

WARNING: *Before handling the NIC, touch the bare metal case of your PC to discharge static electricity from your body. While you are handling the NIC, wear a wrist strap grounded to the PC chassis.*

Meeting PC Requirements

Your PC or server must meet the following requirements to successfully install the NIC:

- 80486, Pentium, or Alpha processor
- Available bus-mastering PCI slot
- Minimum of 640 K of memory

Installation Steps

There are four steps to the 3C90xB or 3C90xC NIC installation:

1. **Run the preinstallation program *before* installing the NIC in the PC.**

   The *EtherCD* preinstallation program prevents conflicts with the NIC and your operating system. It guides you through the NIC installation and must be run *before* you physically install the NIC in the PC.

2. **Install the NIC in the PC.**
3. **Connect the NIC to the network.**
4. **Install the network driver.**

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Installing Multiple NICs

If you are installing multiple EtherLink PCI NICs in a PC or server, follow the instructions in "Installing Multiple NICs" in Chapter 3.

Upgrading Windows 95 to Windows 98

If you are upgrading a PC from Windows 95 to Windows 98 that already has an EtherLink PCI NIC installed, follow the instructions in the WIN98.TXT file located in the HELP directory on the *EtherCD*.

Updating the Network Driver and NIC Software

If you already have an EtherLink PCI NIC installed and want to update the network driver, follow the instructions in "Updating the Network Driver and NIC Software" later in this chapter.

Installing a 3C900 or 3C905 NIC

If you are installing a 3C900 or 3C905 NIC in a PC running Windows 98, follow the instructions in the WIN98.TXT file located in the Help directory on the *EtherCD*. Do not follow the instructions in this chapter.

Installing From Diskette

If your PC does not have a CD-ROM drive, access a PC that has a CD-ROM drive and create installation diskettes from the *EtherCD*.

If you do not have access to a PC that has a CD-ROM drive, contact 3Com to order installation diskettes for *EtherCD* version 5.1:

- Toll-free number for the United States and Canada:
  1-877-226-4604
- Toll number for international calls:
  1-510-226-4604

The installation diskettes allow you to install the network driver only. If you want to install the NIC diagnostics or desktop management software, you must install them from the EherCD.

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Before you start, make sure that you have two blank, formatted diskettes. Label the diskettes *EtherDisk 1* and *EtherDisk 2*.

- *EtherDisk* 1 contains:
  - NDIS 3/4/5 drivers
  - NetWare client and server drivers
  - Windows for Workgroup drivers
  - NIC preinstallation program
  - README.TXT file
- *EtherDisk* 2 contains:
  - NDIS 2 driver
  - PACKET driver
  - Help text files
  - DOS utilities

To create installation diskettes from the *EtherCD*:

1. **Turn on the power to the PC and start Windows.**
2. **Insert the *EtherCD* in the CD-ROM drive.**

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

   `d:\installs\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.
3. **Click *NIC Software*.**
4. **Click *NIC Drivers and Diagnostics*.**
5. **Click *Installation Utilities*.**
6. **Click *Create Installation Diskettes.***

   The *EtherCD* Diskette Creation Utility Welcome screen appears.
7. **Click *Next*.**
8. **Insert the blank, formatted diskette labeled *EtherDisk* 1 in the PC, and then click Next.**

   Files are copied.

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9 Remove the disk and insert the disk labeled *EtherDisk* 2 when prompted, and then click *OK*.

Files are copied. The diskette creation is complete.

For instructions on using the installation diskettes to install the network driver, see the text file for your operating system in the HELP directory on the EtherCD.

Running the Preinstallation Program

Before you physically install the NIC in a PC, run the NIC preinstallation program to properly set up your system environment.

The preinstallation program prevents conflicts with the NIC and your operating system. It guides you through the NIC installation and must be run *before* you physically install the NIC in the PC.

To run the NIC preinstallation program:

1 Do not install the NIC in the PC.

2 Turn on the power to the PC and start Windows.

3 Quit any open applications and disable the automatic protection feature of any anti-virus software that may be running.

4 Insert the *EtherCD* in the CD-ROM drive.

The *EtherCD* Welcome screen appears.

If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

```
d:\installs\setup.exe
```

where d:\ represents the letter name of the CD-ROM drive.

5 Click *NIC Software*.

6 Click *NIC Drivers and Diagnostics*.

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7 **Click *Install NIC Driver*.**

- To install the network driver and the 3Com NIC Diagnostics program, click *Install with Diagnostic Program.*
- To install the network driver only, click *Install without Diagnostic Program*.

Files are copied. A message box appears when the installation is complete.

On a Windows NT 4.0 PC, a message appears stating "Do you have to install NIC drivers for any EtherLink PCI NICs?" Click Yes. If the Microsoft TCP/IP Properties screen appears, complete the information as appropriate for your network, and then click OK.

8 **Click *OK*.**

9 **Select your operating system to continue the installation.**

The Completing NIC Installation screen appears.

10 **Click *Done*.**

11 **Exit the *EtherCD*, and then shut down Windows.**

12 **Turn off the power to the PC.**

Do not remove the *EtherCD* from the CD-ROM drive.

The next step is to install the NIC in the PC. Go to the next section, "Inserting the NIC in the PC."

Inserting the NIC in the PC

The following instructions apply to installing the NIC in most PCs. If these instructions are not appropriate for your PC, refer to the documentation that accompanied your PC.

Do NOT install the NIC in your PC until you have run the preinstallation program, as described in the previous section,"Running the Preinstallation Program."

Before handling the NIC, touch the bare metal case of your PC to discharge static electricity from your body. While you are handling the NIC, wear a wrist strap grounded to the PC chassis.

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To install the NIC in the PC:

1 **Make sure that you have run the preinstallation program, as described in the previous section.**

2 **Remove all jewelry from your hands and wrists. Use only insulated or nonconducting tools.**

3 **Turn off the power to the PC and unplug the power cord.**

4 **Remove the cover from the PC.**

5 **Locate an empty, nonshared bus-mastering PCI slot and remove its slot cover. Save the screw.**

Do not install the NIC in a shared PCI slot. Avoid any PCI slot next to an ISA slot. This is often a shared slot and does not support bus mastering.

If you do not know how to identify a PCI slot, check your PC documentation or ask your system administrator.

If you are planning to install the Remote Wake-Up cable, choose an empty PCI slot that is close to the matching connector on the PC motherboard. The Remote Wake-Up cable is only required if your NIC supports Remote Wake-Up and you want to use this feature.

6 **Carefully insert the NIC in the empty PCI slot.**

Press firmly to ensure that the NIC is fully seated in the slot.

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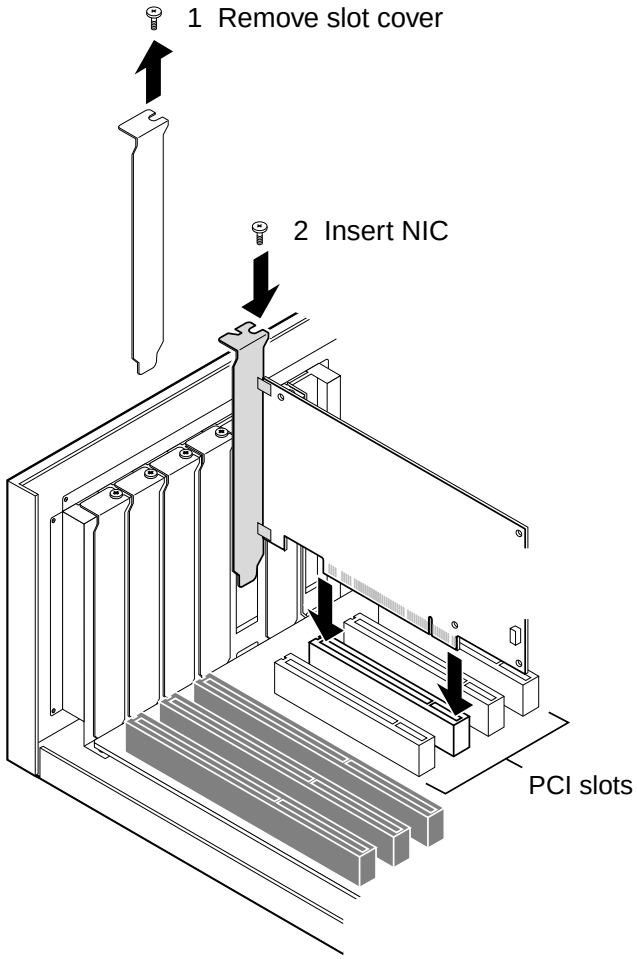

7 Secure the NIC with the screw you removed earlier.

If you want to install the Remote Wake-Up cable, go to the next section, "Connecting the Remote Wake-Up Cable" to continue the installation. If you do not want to connect the cable, continue with step 8.

8 Replace the PC cover and plug in the power cord.

Do not turn on the power to the PC.

The next step is to connect the NIC to the network. Go to "Connecting the NIC to the Network."

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Connecting the Remote Wake-Up Cable

This section describes how to connect the Remote Wake-Up cable from the NIC to the PC motherboard.

Connecting the Remote Wake-Up cable is optional. Connect this cable only if your NIC supports Remote Wake-Up and you want to use this feature.

The following NICs support Remote Wake-Up:

- 3C905C-TX-M
- 3C905B-TX
- 3C905B-TX-M
- 3C905B-COMBO
- 3C905B-FX
- 3C900B-FL

If you have a 3C905C-TX-M NIC and your PC is compliant with PCI 2.2, Remote Wake-Up is automatically enabled through the PCI bus. You do not need to connect the Remote Wake-Up cable.

To connect the Remote Wake-Up cable:

WARNING: *Make sure that the PC power cord is unplugged. Only properly trained and authorized personnel should perform service. Contact your PC manufacturer for information about safe service techniques.*

1. **Make sure that the NIC is properly installed in a PCI slot.**
2. **Insert the Remote Wake-Up cable into the RWU connector on the NIC.**

   Twist the cable twice before attaching the cable to the PC.
3. **Attach the other end of the cable to the connector on the PC motherboard.**

   Refer to your PC documentation if you need help locating the connector.

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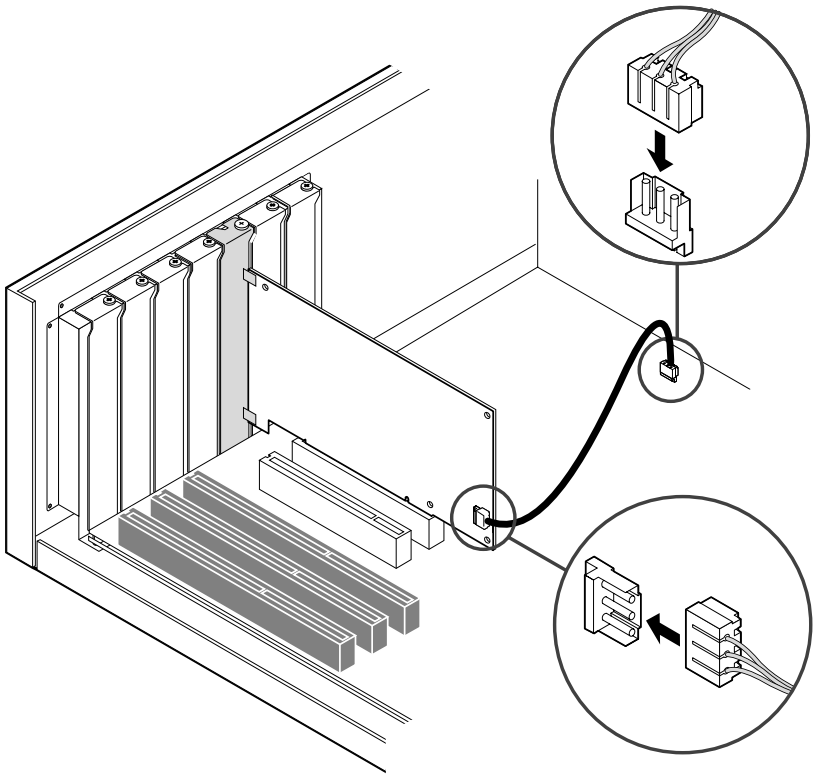

4 Replace the PC cover and plug in the power cord.

Do not turn on the power to the PC. The next step is to connect the NIC to the network. Go to the next section, "Connecting the NIC to the Network."

Connecting the NIC to the Network

Follow the procedure for the port that matches your NIC and your network environment.

RJ-45 Port

On the 3C900B NIC, the RJ-45 port provides a 10 Mbps connection only.

On the 3C905C-TX-M and 3C905B NICs, the RJ-45 port provides a 10 Mbps or 100 Mbps connection automatically, depending on the speed of the connected hub or switch.

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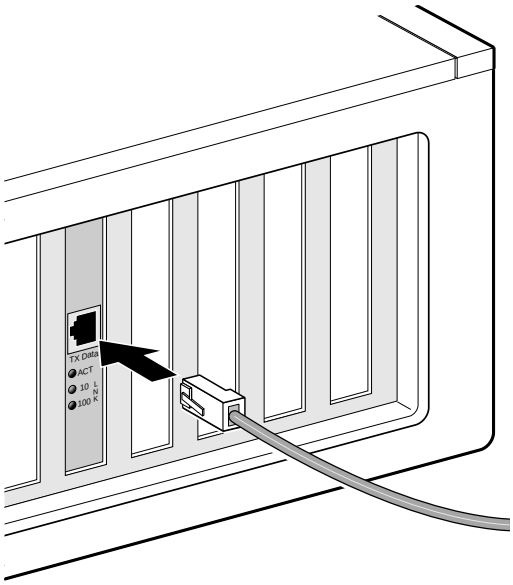
The following table shows the cable requirements and maximum network cable lengths for the RJ-45 port.

Network Environment	Cable Required	Maximum Cable Length
10 Mbps (10BASE-T)	Category 3, 4, or 5 unshielded twisted-pair	100 m (328 ft)
100 Mbps (100BASE-TX)	Category 5 unshielded twisted-pair	100 m (328 ft)

To connect the RJ-45 port:

1 **Plug the RJ-45 connector on the twisted-pair network cable into the RJ-45 port on the NIC backplate.**



2 **Connect the other end of the network cable to an active network port.**

The next step is to install the network driver.

Go to Chapter 3, "Installing NIC Software in Windows," or Chapter 4, "Installing the NetWare Client and Server Drivers."

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BNC Port

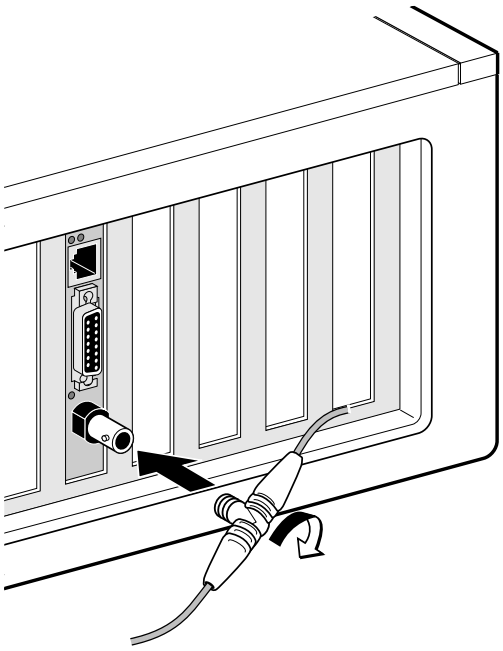
The BNC port provides a 10 Mbps connection only.

The following table shows the cable requirement and maximum network cable length for the BNC port.

Port	Cable Required	Maximum Network Cable Length
BNC	10BASE2 thin Ethernet coaxial (10 Mbps only)	185 m (607 ft)

To connect the BNC port:

1 **Connect the BNC connector on the thin Ethernet cable to the BNC port on the NIC.**



2 **Connect the other end of the network cable to another PC or to a 50-ohm terminator.**

If your PC is the last physical device in the network daisy chain, you must connect a 50-ohm terminator to the other end of the BNC T-connector.

The next step is to install the network driver.

Go to Chapter 3, "Installing NIC Software in Windows," or Chapter 4, "Installing the NetWare Client and Server Drivers."

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AUI Port

The AUI port provides a 10 Mbps connection only.

The following table shows the cable requirement and maximum network cable length for the AUI port.

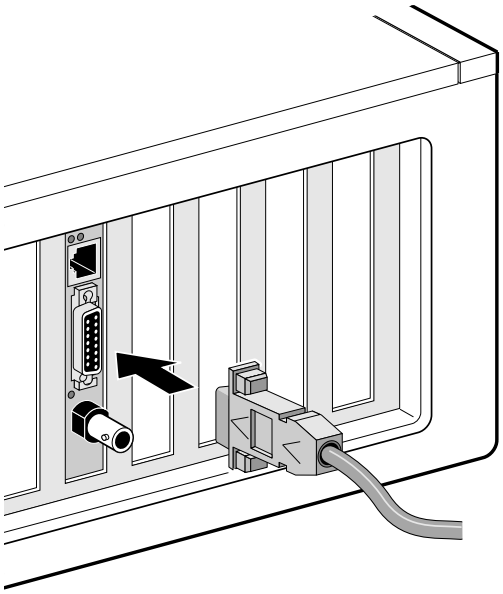
Port	Cable Required	Maximum Network Cable Length
15-pin AUI	10BASE5 thick Ethernet coaxial (10 Mbps only)	500 m (1,640 ft)

To connect the AUI port:

1 **Locate the 15-pin AUI port on the NIC and move the slide latch down to the open position.**

2 **Connect the thick Ethernet coaxial cable to the AUI port on the NIC.**

This connector attaches in only one way. Orient the AUI connector to match the AUI port on the NIC.



3 **Move the slide latch up to the closed position to lock the AUI connector in place.**

4 **Connect the other end of the network cable to an external transceiver.**

The next step is to install the network driver.

Go to Chapter 3, "Installing NIC Software in Windows," or Chapter 4, "Installing the NetWare Client and Server Drivers."

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SC Port

The SC port on the 3C905B-FX NIC provides a 100 Mbps fiber-based connection only.

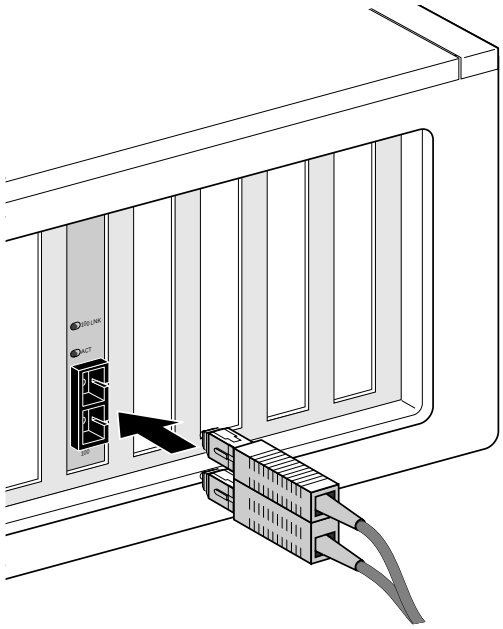
The following table shows the cable requirements and maximum network cable lengths for the SC port.

Port	Cable Required	Maximum Network Cable Length
SC	Long-wavelength fiber-optic (1300 nm):	
	■ 50 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)
	■ 62.5 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)

To connect the SC port:

1 **Remove the protective cover from the NIC's SC connector.**

2 **Connect the network cable to the SC connector on the NIC.**



3 **Connect the other end of the cable to an active 100BASE-FX Fast Ethernet network port.**

The next step is to install the network driver.

Go to Chapter 3, "Installing NIC Software in Windows," or Chapter 4, "Installing the NetWare Client and Server Drivers."

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ST Port

The ST port on the 3C900B-FL NIC provides a 10 Mbps fiber-based connection only.

The following table shows the cable requirements and maximum network cable lengths for the ST port.

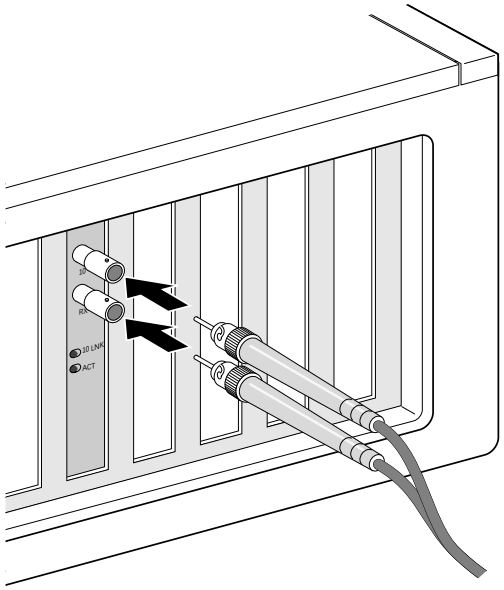
Port	Cable Required	Maximum Network Cable Length
ST	Short-wavelength fiber-optic (850 nm):	
	■ 50 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)
	■ 62.5 µ/125 µ multimode fiber	Full-duplex: 2,000 m (6,560 ft) Half-duplex: 412 m (1,351 ft)

To connect the ST port:

1 **Remove the protective covers from the NIC's ST connector.**

2 **Connect the network cable to the ST connector on the NIC.**

The cable that you use for the 3C900B-FL NIC consists of two individual cables. You can insert either cable into the transmit (10) and receive (RX) connectors on the NIC.



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3 Connect the other end of the network cable to a 10BASE-FL Ethernet network hub or switch.

Insert the cable that is connected to the transmit (10) connector on the NIC into the receive (RX) connector on the network hub or switch.

Insert the cable that is connected to the receive (RX) connector on the NIC into the transmit (TX) connector on the network hub or switch.

The next step is to install the network driver.

Go to Chapter 3, "Installing NIC Software in Windows," or Chapter 4, "Installing the NetWare Client and Server Drivers."

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3 INSTALLING NIC SOFTWARE IN WINDOWS

Overview

This chapter explains how to do the following tasks on a PC running Windows 95, Windows 98, or Windows NT:

- Install the network driver using *EtherCD* 5.1
- Install the NIC diagnostics program after you have already installed the network driver
- Update the network driver or NIC diagnostics program
- Install multiple NICs

To obtain the latest shipping version of a driver, go to:

http://www.3com.com/

The network driver can be used in both Microsoft and NetWare network environments.

For instructions on using the installation diskettes (which can be created from the EtherCD*) to install the network driver, see the text file for your operating system in the HELP directory on the* EtherCD.

Installing the Network Driver Using the *EtherCD*

To install the network driver using the *EtherCD*, follow the steps for your operating system.

These instructions describe how to install the network driver using the EtherCD *after you have run the preinstallation program, as described in Chapter 2. For instructions on installing the network driver from installation diskettes, see the text file for your operating system in the HELP directory on the* EtherCD.

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Before installing the network driver:

- Make sure that you have run the preinstallation program, as described in Chapter 2.
- Make sure that the NIC is installed in the PC and that it is connected to the network.
- Make sure that you have the Windows installation files (Windows 95/98 only). These files may be on a CD or diskettes, or they may have been copied to your hard drive when Windows was installed on your PC.

Windows 95

To install the network driver:

1 **Turn on the power to the PC.**

Windows 95 detects the NIC. The Insert Disk dialog box appears, prompting you to insert the *EtherCD*.

If the New Hardware Found screen appears or the Update Device Driver Wizard starts, the NIC preinstallation program was not run on the PC. Follow the instructions in the W95NDIS.TXT file located in the Help directory on the EtherCD *to continue the installation.*

2 **Make sure that the *EtherCD* is inserted in the CD-ROM drive.**

3 **Click** OK**.**

The Copying Files dialog box appears.

4 **Open the pull-down menu and select:**

`c:\windows\options\cabs`

5 **Click *OK*.**

Files are copied.

If this is the first time that networking is being installed on your PC, the Identification tab of the Network screen appears. Go to step 6.

If networking has already been installed, you are prompted for the Windows 95 CD. Go to step 7.

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6 **In the specified fields of the Identification tab screen, enter the following information, and then click *OK*:**

Computer Name — Identifies the PC on the network for other users. This entry must be a unique name of 15 characters or fewer, containing no spaces.

Workgroup — Identifies the group (for example, your department name) to which your PC belongs. If you belong to a peer-to-peer network, this entry must be exactly the same for all the PCs in your network.

Computer Description — Displays additional details to other users on the network about this PC. For example, you could specify that the PC has a printer attached. Filling in this field is optional.

7 **Remove the *EtherCD* from the CD-ROM drive, insert the Windows 95 CD, and then click *OK*.**

Files are copied. You are prompted to restart the PC.

8 **Remove the Windows 95 CD, and then click *Yes* to restart the PC.**

You must restart the PC to complete the installation.

The installation is complete. Go to "Verifying Successful Installation" later in this guide to confirm that the NIC is properly installed.

After Windows restarts, double-click the Network icon in the Windows Control Panel and make sure that the correct configuration settings are selected for your network environment. Contact your system administrator for assistance.

Windows 98

To install the network driver:

1 **Turn on the power to the PC.**

Windows 98 detects the NIC. The Insert Disk dialog box appears, prompting you to insert the *EtherCD*.

If the Add New Hardware Wizard starts, the NIC preinstallation program was not run on the PC. Follow the instructions in the WIN98.TXT file located in the Help directory on the EtherCD *to continue the installation.*

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2 **Make sure that the *EtherCD* is inserted in the CD-ROM drive.**

3 **Click *OK*.**

The Insert Disk dialog box appears.

4 **Open the pull-down menu and select:**

`c:\windows\options\cabs`

5 **Click *OK*.**

Files are copied.

If you are prompted for the EtherCD, click OK, make sure that the drive letter of the CD-ROM drive (for example, d:\) appears in the dialog box, and then click OK.

You are prompted for the Windows 98 CD.

6 **Remove the *EtherCD*, insert the Windows 98 CD, and then click *OK*.**

Files are copied. You are prompted to restart the PC.

7 **Remove the Windows 98 CD, and then click *Yes* to restart the PC.**

You must restart the PC to complete the installation.

The installation is complete. Go to the next section, "Verifying Successful Installation," to confirm that the NIC is properly installed.

After Windows restarts, double-click the Network icon in the Windows Control Panel and make sure that the correct configuration settings are selected for your network environment. Contact your system administrator for assistance.

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Windows NT 4.0

To install the network driver:

1. **Turn on the power to the PC.**
2. **Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.**

   The Network window appears.
3. **Click the Adapters tab.**

   If networking has not been installed on your PC before, Windows NT asks you if you want to install networking. Click *Yes*. See the WINNT.TXT file located on the *EtherCD* or your Windows NT documentation for instructions.
4. **Click *Add*.**

   The Select Network Adapter dialog box appears.
5. **Click *Have Disk*.**

   The Insert Disk dialog box appears.
6. **Insert the *EtherCD* in the CD-ROM drive.**
7. **Make sure that the letter name of the CD-ROM drive (for example, d:\ appears in the entry box, and then click *OK*.**

   The Select OEM Option dialog box appears.
8. **Make sure that the 3Com EtherLink PCI NIC is selected, and then click *OK*.**

   The Adapters tab of the Network screen appears.
9. **Click *Close*.**

   If the Microsoft TCP/IP Properties screen appears, enter the requested information for your network environment. Refer to your system administrator or the Windows NT documentation for assistance.

   If the Microsoft TCP/IP Properties screen does not appear, the installation is complete.
10. **Click *Yes* to restart the PC.**

    The network driver installation is complete. Go to "Verifying Successful Installation" later in this chapter to confirm that the NIC is properly installed.

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Windows NT 3.51

To install the network driver:

1. **Turn on the power to the PC.**
2. **In the Main window of the Program Manager, double-click the Control Panel icon and then the Network icon.**
3. **Click *Add Adapter.***

   The Add Network Adapter window appears.
4. **Open the Network Adapter Card list box, and scroll down and select *<Other> Requires disk from manufacturer*.**
5. **Click *Continue*.**

   The Insert Disk dialog box appears.
6. **Insert the *EtherCD* in the CD-ROM drive. Make sure that d:\ appears in the entry box, where d:\ represents the letter name of the CD-ROM drive, and then click *OK*.**

   The Select OEM Option window appears.
7. **Make sure that the *name of the NIC* is selected, and then click *OK*.**

   Files are copied. The Network Settings window appears. The name of the installed NIC appears in the list of installed adapter cards.
8. **Click *OK*.**

   If the TCP/IP Configuration screen appears, enter the requested information for your network environment. Refer to your system administrator or the Windows NT documentation for assistance.

   If the TCP/IP Configuration screen does not appear, the installation is complete.
9. **Restart the PC.**

   The installation is complete. Go to the next section, "Verifying Successful Installation," to confirm that the NIC is properly installed.

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Verifying Successful Installation

Follow the steps for your operating system.

Windows 95 and Windows 98

To verify successful NIC installation:

1. **Open the Windows *Start* menu, select *Settings*, and then select *Control Panel*.**
2. **Double-click the System icon, and then select the Device Manager tab.**
3. **Double-click *Network adapters* and make sure that the name of the 3Com EtherLink NIC appears.**

   If a red X or a yellow exclamation point (!) appears next to the name of the NIC, the installation was not successful. See "Troubleshooting the NIC Installation" in Chapter 6 for troubleshooting help.

Windows NT 4.0

To verify successful NIC installation:

1. **Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.**
2. **Select the Adapters tab.**
3. **Make sure that the name of the NIC appears in the list of network adapters.**

   If the name of the NIC does not appear in the list of network adapters, the installation was not successful. See "Troubleshooting the NIC Installation" in Chapter 6 for troubleshooting help.

Windows NT 3.51

To verify successful NIC installation:

1. **Double-click the File Manager icon.**
2. **From the *Disk* menu, select *Connect Network Drive*.**

   The presence of network server names confirms successful installation.

   If you cannot connect a network drive, the installation was not successful. See "Troubleshooting the NIC Installation" in Chapter 6 for troubleshooting help.

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Installing the 3Com NIC Diagnostics Program

This section describes how to install the 3Com NIC Diagnostics program after you have already installed the network driver. This program is for PCs running Windows 95, Windows 98, or Windows NT 4.0.

The 3Com NIC Diagnostics program allows you to run tests that determine the status of your network, the NIC, and Remote Wake-Up. It also allows you to configure the NIC, view network statistics, and access support databases.

When you install the 3Com NIC Diagnostics program, your network driver is automatically updated to the latest version on the EtherCD*.*

To install the 3Com NIC Diagnostics program:

1 **Turn on the power to the PC and start Windows.**

2 **Insert the *EtherCD* in the CD-ROM drive.**

The *EtherCD* Welcome screen appears.

If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

`d:\installs\setup.exe`

where d:\ represents the letter name of the CD-ROM drive.

3 **Click *NIC Software*.**

4 **Click *NIC Drivers and Diagnostics*.**

5 **Click *Update NIC Driver*.**

6 **Click *Update with Diagnostic Program.***

7 **Select your operating system to continue the installation.**

The Completing NIC Installation screen appears.

8 **Click *Done*.**

9 **Exit the *EtherCD*, and then restart Windows.**

The installation is complete.

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To start the 3Com NIC Diagnostics program:

1 **Open the Windows *Start* menu.**

2 **Select *Programs*, and then *3Com NIC Utilities.***

3 **Click *3Com NIC Doctor.***

For instructions on using the program, see "Running the NIC Diagnostics Tests" in Chapter 7.

Updating the Network Driver and NIC Software

This section describes how to update your network driver and NIC diagnostic software.

1 **Turn on the power to the PC and start Windows.**

2 **Insert the *EtherCD* in the CD-ROM drive.**

The *EtherCD* Welcome screen appears.

If the *EtherCD* Welcome screen does not appear, enter the following command from Run option of the Windows Start menu:

```
d:\installs\setup.exe
```

where d:\ represents the letter name of the CD-ROM drive.

3 **Click *NIC Software*.**

4 **Click *NIC Drivers and Diagnostics*.**

5 **Click *Update*.**

To update the network driver only, click *Without Diagnostics*.

To update the network driver and NIC diagnostics software, click *With Diagnostics*.

6 **Follow the prompts on the screen.**

Installing Multiple NICs

This section describes how to install multiple EtherLink PCI (3C90x) NICs in a Windows 95, Windows 98, or Windows NT 4.0 PC.

You must use these procedures to install multiple NICs. Failure to follow these procedures may lead to problems requiring you to reinstall your operating system.

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Windows 95 and Windows 98

To install multiple NICs in a PC running Windows 95 or Windows 98, install and configure each NIC individually, following these steps:

1. **Run the preinstallation program before installing the NICs in the PC, as described in Chapter 2.**
2. **Install the first NIC in your PC and connect it to the network, as described in Chapter 2.**

CAUTION: *Do not physically install the second NIC in your PC until you complete the driver installation for the first NIC, following the steps below.*

3. **Turn on the power to the PC and start Windows.**
4. **Insert the *EtherCD* when prompted, and then click *OK*.**
5. **Follow the prompts on the screen to install the network driver.**

   See the "Windows 95" or "Windows 98" section earlier in this chapter for instructions.
6. **After the network driver is installed, restart the PC.**
7. **After the PC restarts, exit Windows and turn the power off to the PC. Make sure that the PC is unplugged.**
8. **Install the second NIC in your PC and connect it to the network.**
9. **Plug in the PC power cord, turn on the power to the PC, and then start Windows.**

   Windows detects the second NIC. The second NIC uses the same network driver as the first NIC. You are not prompted for the *EtherCD*.

   When Windows starts, the second NIC appears under *Network adapters* in the Device Manager.
10. **Repeat the process for each additional NIC to be installed.**

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Windows NT 4.0

To install multiple NICs in a PC running Windows NT 4.0:

1. **Install the NICs in your PC and connect each to the network.**
2. **Turn on the power to the PC and start Windows NT.**
3. **Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.**

   The Network screen appears.
4. **Select the Adapters tab.**
5. **Click *Add*.**

   The Select Network Adapter screen appears.
6. **Click *Have Disk*.**
7. **Insert the *EtherCD*.**
8. **Make sure that d:\ appears in the entry box (where d:\ represents the letter name of the CD-ROM drive), and then click *OK*.**

   The Select OEM Option screen appears with the name of one of the NICs selected. Only one NIC appears on this screen.
9. **Click *OK*.**

   Files are copied. The Network screen appears with the name of the first installed NIC.
10. **Close the Network screen.**

    If you are prompted for network information, enter the requested information.
11. **Restart the PC.**
12. **When Windows NT starts, repeat steps 3 through 11 for each NIC that is installed in the PC.**

You will not be prompted for the EtherCD *when you install the network driver for the second NIC.*

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4 INSTALLING THE NETWARE CLIENT AND SERVER DRIVERS

Overview

This chapter describes how to:

- Install the Novell NetWare client driver for DOS, Windows 3.1, or Windows for Workgroups.
- Install the NetWare 3.x, 4.x, and 5.x server drivers.

To obtain the latest shipping version of a driver, go to:

http://www.3com.com/

Installing the NetWare Client Driver

The NetWare client driver enables PCs running DOS, Windows 3.x, or Windows for Workgroups to access resources on a NetWare 3.x, 4.x, or 5.x network.

Use the 3Com intelligent auto install software (COMSLINK) to install the client software and drivers for Novell NetWare 3.x, 4.x, or 5.x.

Do not use the intelligent auto install software if you are running Windows 95, Windows 98, or Windows NT. See "Installing NIC Software in Windows" for procedures to install network drivers under these operating systems.

About 3Com Intelligent Auto Install Software

The 3Com intelligent auto install software automatically configures your NIC and PC for use as a NetWare client.

The intelligent auto install software creates a new AUTOEXEC.BAT file and saves the old file as AUTOEXEC.3CM. It also creates a new CONFIG.SYS file and saves the old file as CONFIG.3CM.

The 3Com intelligent auto install software does not support Japanese versions of DOS and Windows 3.1x.

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Intelligent Auto Install Requirements

To use the intelligent auto install program:

- Make sure that your PC has only one EtherLink PCI NIC installed.
- Make sure that you are using NetWare 3.x, 4.x, or 5.x as your network operating system.
- Make sure that your PC has at least 1 MB of available hard drive space.

Running the Intelligent Auto Install Software

To run the intelligent auto install software to install the client software and drivers for a NetWare network:

1. **Install the NIC and connect it to the network, as described in Chapter 2.**
2. **Reboot to DOS.**
3. **Insert the *EtherCD* in the CD-ROM drive.**
4. **At the DOS prompt, enter the following command, where d is the drive letter of your CD-ROM drive:**

   `d:install`

   The main menu appears.
5. **Select *Auto Install and Config for NetWare* and press Enter.**
6. **Select *DOS*, *Windows 3.1x*, or *Windows for Workgroups 3.11,* and follow the instructions.**
7. **When the installation process is finished, remove the *EtherCD* and reboot the PC.**

If you are running Windows 3.1x, after you connect to the NetWare server, run the WSINSTALL program for full Windows support. Contact your system administrator for the location of this NetWare utility.

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Installing the NetWare Server Driver

This section describes how to install the NetWare driver on a Novell server running NetWare 3.x, 4.x, or 5.x.

The EtherLink PCI NICs do not support NetWare 3.xx or 4.xx servers that are not updated to the latest driver pack.

The \NWSERVER\NW3.x directory contains the network driver file (3C90X.LAN) to be used for servers running NetWare 3.x.

The \NWSERVER directory contains the network driver file (3C90X.LAN) to be used for servers running NetWare 4.x or 5.x.

Additional files (NetWare Loadable Modules [NLMs]) that are required for servers running NetWare are on the *EtherCD* in the \NWSERVER directory, or they can be obtained from Novell.

Obtaining NetWare Loadable Modules

You can obtain current NLMs for the NetWare servers listed in the table below from the Novell World Wide Web site:

http://www.support.novell.com

NetWare Server	NLM Name
NetWare 3.12	ETHERTSM.NLM
	NBI31.NLM
	MSM31X.NLM
NetWare 4.10, 4.11	ETHERTSM.NLM
	NBI.NLM
	MSM.NLM
NetWare 5.x	ETHERTSM.NLM
	MSM.NLM

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NetWare 3.12

To install the driver in a NetWare 3.12 server:

1. **Copy the MSM31X.NLM, ETHERTSM.NLM, and NBI31.NLM files from the *EtherCD* to the directory on your hard drive where other NLM files are located.**
2. **Copy the LAN driver file (3C90X.LAN) from the *EtherCD* to the same directory.**
3. **Add the following two lines to the AUTOEXEC.NCF file:**

```
load C:\NWSERVER\3C90X.LAN slot=<slot>
NAME=<name> FRAME=<frametype>
bind ipx to <name> net=<number>
```

4. **Save and exit the file, and then reboot the server.**

NetWare 4.x

There are two ways to install the NetWare 4.x driver:

- Import the driver when installing the NetWare server software.
- Copy the driver to the server's hard disk, and then load the driver manually.

*Make sure that you have the latest NetWare Support Pack installed. that changes the LOADER.EXE file and provides the NBI.NLM, MSM.NLM, and ETHERTSM.NLM files. 3Com has provided the latest *.NLM files (at time of testing) on the* EtherCD *in the \NWSERVER directory.*

Importing the Server Driver

To import the server driver into a NetWare 4.x server:

1. **Install the NetWare server software.**
2. **Insert the *EtherCD* in the CD-ROM when the NIC selection menu appears.**
3. **Press [Insert].**

   This key tells the server installation program that you want to add a driver externally.
4. **Press [F3].**

   This key tells the server installation program that you want to change the path.

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5 **At the prompt, enter the command:**

`NWSERVER`

For example:

`a:\nwserver`

The installation program gathers the files and prompts you for a NIC selection.

6 **Press [Enter] to select the driver displayed and continue the installation.**

Loading the Driver Manually

To update an existing server driver manually:

1 **Copy all of the files from the \NWSERVER subdirectory on the *EtherCD* to the server's hard drive.**

2 **Boot the server and launch the Install program.**

3 **Edit the AUTOEXEC.NCF file to add the following line (assuming the server start directory is C:\NWSERVER, where the LAN drivers and NLM files were copied):**

`LOAD C:\NWSERVER\3C90X.LAN SLOT=<slotnumber>`

The <slotnumber> variable is the hexadecimal slot number of the PCI NIC. See "Verifying the PCI Slot Number" for instructions on obtaining this number.

NetWare 5.x

There are two ways to install the NetWare 5.x driver:

- Import the driver when installing the NetWare server software.
- Copy the driver to the server's hard disk, and then load the driver manually.

Importing the Server Driver

To import the server driver into a NetWare 5.x server:

1 **Install the NetWare server software.**

2 **Press [ESC] when the new hardware screen appears.**

3 **Insert the *EtherCD* in the CD-ROM when the NIC selection menu appears.**

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4 **Press [Insert].**

This key tells the server installation program that you want to add a driver externally.

5 **Press [F3].**

This key tells the server installation program that you want to change the path.

6 **At the prompt, enter the following command:**

`NWSERVER`

For example:

`a:\nwserver`

The installation program gathers the files and prompts you for a NIC selection.

7 **Press [Enter] to select the driver displayed and continue the installation.**

Loading the Driver Manually

To update an existing server driver manually:

1 **Copy all of the files from the \NWSERVER subdirectory on the *EtherCD* to the server's hard drive.**

2 **Boot the server and launch the Install program.**

3 **Add the following line to the AUTOEXEC.NCF file (assuming the server start directory is C:\NWSERVER, where the LAN drivers and NLM files were copied):**

`LOAD C:\NWSERVER\3C90X.LAN SLOT=<slotnumber>`

The <slotnumber> variable is the hexadecimal slot number of the PCI NIC. This address can be obtained by issuing a load command, where the driver identifies the slot numbers. Pressing Esc prevents loading the driver. Because of Novell's scheme for identifying PCI slots, it is not possible for 3Com to pre-identify the slot number.

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Installing Multiple NICs

To support more than one NIC in a NetWare server, change the AUTOEXEC.NCF file to the following format:

```
load C:\NWSERVER\3C90X.LAN slot=<slot1>
NAME=<name1> FRAME=<frametype1>
bind ipx to <name1> net=<net1>
load C:\NWSERVER\3C90X.LAN slot=<slot2>
NAME=<name2> FRAME=<frametype2>
bind ipx to <name2> net=<net2>
```

The values <slot1> and <slot2> are the numbers of the PCI slots in which the NICs are physically installed. To view the numbers of these PCI slots, use the 3Com Configuration and Diagnostic program for DOS. See the next section, "Verifying the PCI Slot Number," for instructions.

The values <name1> and <name2> are unique names assigned to each NIC by your system administrator. The values <name1> and <name 2> must be different.

The frame parameters <frametype1> and <frametype2> can be one of the following:

- Ethernet_802.2
- Ethernet_802.3
- Ethernet_II
- Ethernet_SNAP

Make sure that the frametype for the server and the workstation is the same. For example, if the server uses Ethernet_802.2, the workstation must also use Ethernet_802.2.

The values <net1> and <net2> are unique numbers assigned by the system administrator to each NIC. Make sure that <net1> and <net2> are different numbers.

See the appropriate Novell NetWare manuals for further information.

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Verifying the PCI Slot Number

To verify the PCI slot number in which a NIC is installed:

1. **Boot the NetWare server with the -na option.**

   This prevents the AUTOEXEC.NCF file from loading. For example, enter:

   ```
   server -na
   ```

2. **Issue the load command for the NIC LAN driver without a slot parameter.**

   For example, enter:

   ```
   load c:\nwserver\3c90x.lan
   ```

3. **NetWare lists the valid slot number(s) for the NIC, depending on how many NICs are installed. The values appearing in the list are the slot values that you should use.**

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5 CONFIGURING THE NIC

Overview

This chapter describes how to configure the NIC.

Before you change the NIC configuration settings, contact your system administrator.

Default NIC Settings

The table below lists the configuration settings for the NIC. The default setting is in bold in the Settings column.

Option	Description	Settings
Network Driver Optimization	Specifies how to optimize the network driver for your network by allowing trade-offs between network performance and CPU utilization. ■ *Normal* balances CPU utilization and network performance. ■ *Minimized CPU Utilization* saves CPU resources for other tasks. ■ *Maximized Network Performance* is appropriate if no other applications are making major demands on CPU resources.	■ **Normal** ■ Minimized CPU Utilization ■ Maximized Network Performance
Duplex	Determines if the NIC transmits data across the network in both directions simultaneously (full-duplex) or in one direction at a time (half-duplex). ■ *Auto Select* allows the NIC to automatically connect at the duplex mode of the connected hub or switch. When you select this setting, the *Media Type* is automatically set to *Auto Select*. ■ *Full-Duplex* sets the NIC to operate in full-duplex mode. To use this setting, the switch that you are connected to must support full-duplex. You must also manually set the NIC *Media Type* setting. ■ *Half-Duplex* sets the NIC to operate in half-duplex mode. You must also set the NIC *Media Type* setting.	■ **Auto Select** ■ Full-Duplex ■ Half-Duplex

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Option	Description	Settings
Boot PROM	Enables or disables the NICs boot ROM (if a boot ROM is installed on the NIC).	■ **Enabled** ■ Disabled
Media Type	Determines the type of media your network is using. ■ *Auto Select* allows the NIC to automatically select the Media Type for you. ■ If you set the NIC *Duplex* setting to *Auto Select*, the *Media Type* is automatically set to *Auto Select*. ■ If you set the NIC *Duplex* setting manually, you must set the *Media Type* setting manually.	■ **Auto Select** ■ 10BASE-T (10Mb/s) ■ 100BASE-TX (100Mb/s) ■ AUI ■ BNC ■ 100BASE-FX ■ 10BASE-FL

Configuration Methods

The NIC can be configured using any of the methods listed in the table below.

This chapter describes how to configure the NIC using the 3Com NIC Diagnostics program for Windows. For instructions on using the other two methods, see the file or appendix mentioned in the table.

Method	Description	Requirement(s)
3Com NIC Diagnostics program for Windows	Configure the NIC locally using the 3Com NIC Diagnostics program for Windows: **1** Make sure that the 3Com NIC diagnostics program is installed. See "Installing the 3Com NIC Diagnostics Program" in Chapter 3 for instructions. **2** Open the Windows *Start* menu. **3** Select *Programs*, and then *3Com NIC Utilities*. **4** Click *3Com NIC Doctor*.	Windows 98, Windows 95, or Windows NT 4.0

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Method	Description	Requirement(s)
3Com Configuration and Diagnostics program for DOS	Configure the NIC locally using the 3Com Configuration and Diagnostics program for DOS: **1** Reboot the PC using a DOS-bootable diskette. **2** Insert the *EtherCD* in the PC. **3** Enter at the DOS prompt: **`d:\3c90xcfg.exe`** See the DOSDIAG.TXT file located in the HELP directory on the *EtherCD* for more information. Customers running Japanese DOS must switch to U.S. mode DOS before running this program.	DOS, Windows NT 3.51, Windows 3.x, or Windows for Workgroups
DMI 2.0 or 2.0s	Configure the NIC remotely using the 3Com DMI Agent software. See Appendix C, "Installing the 3Com DMI Agent" for more information.	3Com DMI Agent and a DMI-compatible browser or a network management application that supports DMI 2.0 or 2.0s

Changing General NIC Configuration Settings

Before you configure the NIC, make sure that:

- The NIC is installed in the PC and is connected to the network.
- The network driver is installed.
- The 3Com NIC Diagnostics program is installed.

To change the NIC general configuration settings, such as network driver optimization, duplex mode, and media type:

1 **Open the Windows *Start* menu.**

2 **Select *Programs*, and then *3Com NIC Utilities.***

3 **Click *3Com NIC Doctor.***

The 3Com NIC Diagnostics General screen appears.

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Click Help to obtain general information about the function of a screen. To obtain specific information about any topic on a screen, click the question mark (?) in the upper right corner of the screen, move it over a topic, and click once.

4 **If your PC has more than one NIC installed, open the Network Interface Card (NIC) list box and select the NIC to be configured.**

5 **Click the Configuration tab.**

The Configuration screen appears.

6 **Under Network Parameter, select the setting to be changed.**

For a description of each setting, click the question mark (?) in the upper right corner of the screen, move it over a setting, and click once.

7 **Open the Set Value list box and select a new value from the list of available options.**

Repeat the process to change any other configuration setting.

To undo changes and return the settings to their previous values, click *Undo Changes*.

To return the settings to the factory default settings, click *Set Factory Defaults*.

8 **Click *OK* to save the changes and exit the program.**

Configuring the Managed PC Boot Agent (MBA)

This section explains how to configure the 3C905C-TX-M and 3C905B-TX-M NICs' Managed PC Boot Agent (MBA) boot ROM to boot from the network.

For detailed information on using, configuring, and troubleshooting the MBA boot ROM, see the Managed PC Boot Agent User Guide*, located with the MBA software on the* EtherCD*.*

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Enabling or Disabling the Boot ROM Setting

The default NIC boot ROM setting is *Enabled*. This setting must be enabled to boot from the network.

To enable or disable the NIC boot ROM setting:

1. **Make sure that the NIC is installed and is connected to the network and that the NIC driver is installed.**
2. **Open the Windows *Start* menu.**
3. **Select *Programs*, and then *3Com NIC Utilities.***
4. **Click *3Com NIC Doctor.***

   The 3Com NIC Diagnostics General screen appears.
5. **Click the Configuration tab.**

   The Configuration screen appears.
6. **Under Network Parameter, select *Boot PROM*.**
7. **Open the Set Value list box and select *Enabled* to enable the boot ROM or *Disabled* to disable the boot ROM.**
8. **Click *OK* to save the setting and exit the program.**

Booting From the Network

The boot process for the MBA boot ROM varies depending on the type of PC you have (BBS BIOS-compatible or non-BBS BIOS-compatible).

If your PC was purchased recently, it may be BBS (BIOS Boot Specification) BIOS-compatible. The BBS determines how the system BIOS identifies boot devices in a PC (such as a CD-ROM drive, a hard drive, or a floppy drive), allows the user to select the boot order of these devices, and then attempts to boot from each device in the specified order.

Refer to your PC documentation if you do not know which type of PC you have.

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BBS BIOS-Compatible PCs

To enable a BBS BIOS-compatible PC to boot from the network using the MBA boot ROM:

1 **Make sure that the NIC boot ROM setting is *Enabled.***

See the previous section, "Enabling or Disabling the Boot ROM Setting," for instructions.

2 **Set the MBA manually as the first boot device in the PC BIOS.**

Refer to your PC documentation for instructions on accessing and configuring the PC BIOS.

3 **Reboot the PC.**

The MBA attempts to boot from the network using the default boot method PXE.

To change the default method or any other MBA configurations, press Ctrl+Alt+B when the following message appears:

```
Initializing MBA. Press Ctrl+Alt+B to
configure...
```

If the network boot fails, the following message appears:

```
Network boot aborted, press any key to
continue
```

The BIOS continues to the next device in the boot order (for example, the local hard drive).

To cancel the network boot, press Esc anytime during the network boot process

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Non-BBS BIOS-Compatible PCs

To enable a non-BBS BIOS-compatible PC to boot from the network using the MBA boot ROM:

1 **Make sure that the NIC boot ROM setting is *Enabled.***

See "Enabling or Disabling the Boot ROM Setting" earlier in this chapter for instructions.

2 **Change the MBA default boot setting from *Local* to *Network*.**

To change the default boot setting or any other MBA configurations, use the MBACFG utility located on the MBA utility diskette or press Ctrl+Alt+B when the following message appears:

```
Initializing MBA. Press Ctrl+Alt+B to
configure...
```

For more information on using, configuring, and troubleshooting the MBA boot ROM, see the Managed PC Boot Agent User Guide*, located with the MBA software on the* EtherCD*.*

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6 TROUBLESHOOTING THE NIC

Overview

This chapter explains how to:

- Access 3Com support databases.
- Troubleshoot NIC installation problems.
- Troubleshoot NIC and network connection problems.
- Troubleshoot Remote Wake-Up.
- Remove the network driver.
- Remove the NIC diagnostics software.

To access a database of technical information that can help you diagnose and solve NIC installation, configuration, and upgrade problems, go to:

http://knowledgebase.3com.com

Accessing 3Com Support Databases

In addition to the 3Com support databases listed in this section, check the README.TXT and the Help text files located in the HELP directory on the *EtherCD* for troubleshooting information.

Accessing the 3Com Knowledgebase

To access a database of technical information that can help you diagnose and solve NIC installation, configuration, and upgrade problems, go to:

http://knowledgebase.3com.com

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Accessing the 3Com NIC Help System

To access the 3Com NIC Help system:

1. **Make sure that the NIC, its driver, and the 3Com NIC Diagnostic program are installed.**

   See "Installing the 3Com NIC Diagnostics Program" for instructions.

2. **Open the Windows *Start* menu.**
3. **Select *Programs*, and then *3Com NIC Utilities*.**
4. **Select *3Com NIC Doctor Help*.**

   The main Help screen appears.

5. **Click *Help Topics* to display a list of Help topics or click *Find* to search for a Help topic.**

Accessing Release Notes and Frequently Asked Questions

To access release notes and frequently asked questions about the NIC:

1. **Make sure that the NIC, its driver, and the 3Com NIC Diagnostic program are installed.**

   See "Installing the 3Com NIC Diagnostics Program" for instructions.

2. **Open the Windows *Start* menu.**
3. **Select *Programs*, and then *3Com NIC Utilities.***
4. **Click *3Com NIC Doctor.***

   The 3Com NIC Diagnostics General screen appears.

5. **Click the Support tab.**

   The Support screen appears.

6. ***Click Support Databases* to display customer support databases about the NIC in three categories:**

   Release notes — Display tips about installing and using the NIC.

   Frequently asked questions — Display common questions asked by customers and answered by 3Com support experts.

   Knowledgebase topics — Display NIC compatibility topics.

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Troubleshooting the NIC Installation

If you encounter any of the following problems or error messages, follow the steps under "Cleaning Up a Failed Installation" to resolve the problem.

Problems/Error Messages

- A red X or a A yellow exclamation point (!) appears next to the name of the NIC in the Windows Device Manager.
- The Network Neighborhood icon does not appear on the Windows desktop.
- The NIC does not appear in the Network Configuration or Properties window.
- Error: "This device is not present, not working properly, or does not have all of the driver installed. Code 22."
- Error: "Windows was unable to locate a driver for this device."
- Error: "You have selected a plug and play adapter. Please turn off your machine an install the adapter. Then turn on your machine and reinstall."

Cleaning Up a Failed Installation

If the network driver installation failed, follow the steps below to clean up your system and install the NIC correctly.

This procedure:

- Removes all 3C90x NICs from your system.
- Removes the 3Com NIC Diagnostics program.
- Installs the latest network driver.

You can reinstall the 3Com NIC Diagnostics program after completing this procedure. See "Installing the 3Com NIC Diagnostics Program" in Chapter 3 for instructions.

1. **Insert the *EtherCD* in the CD-ROM drive.**

   The *EtherCD* Welcome screen appears.

2. **Click *Drivers*, and then click *Utilities*.**
3. **Click *Clean Up Failed Installation*.**
4. **Click *Proceed*.**

   A warning message appears.

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5 **Click *OK*.**

A message appears stating that all of the EtherLink NICs have been removed from your system.

6 **Click OK.**

7 **Exit the *EtherCD*, and then exit Windows.**

8 **Reboot the PC.**

9 **Install the network driver, as described in "Installing the Network Driver Using the EtherCD" in Chapter 3.**

If you are prompted for 3Com files when Windows restarts, open the drop-down box and select the following path:

```
\options\cabs
```

To verify successful installation, see "Verifying Successful Installation" in Chapter 3.

Troubleshooting the Network Connection

If you encounter problems with using the NIC or connecting to the network, check the table below for troubleshooting tips.

CAUTION: *Before inserting or removing the NIC from the PC, turn the PC power off and unplug the power cord.*

Tip	Description
Check the NIC installation	■ Make sure that you have run the preinstallation program, as described in Chapter 2. This program must be run *before* installing the NIC in the PC. ■ Make sure that the NIC is installed correctly in a PCI slot. Check for specific hardware problems, such as broken traces or loose or broken solder connections.
Check the network connection	■ Inspect all cables and connections. Make sure that the cable complies with its proper length and specifications, as described in Chapter 2.
Check your PC BIOS	■ Make sure that you are running the latest BIOS for your PC. If your BIOS has not been upgraded in the previous 12 months, contact your PC manufacturer to obtain the current version of your BIOS software.

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Tip	Description
Run the NIC diagnostic tests	■ Run the NIC and Network Tests, as described in "Running the NIC Diagnostics Tests" in Chapter 7. If the tests fail, replace the NIC with a known working NIC and run the tests again, using the same configuration settings as those used on the failed NIC. If the working NIC passes all tests, the original NIC is probably defective. For information on product repair, see Appendix D.
Check the 3Com support databases	Review the known problems and solutions found in the following areas: ■ 3Com Knowledgebase ■ 3Com NIC Help system ■ Release Notes and Frequently Asked Questions See "Accessing 3Com Support Databases" earlier in this chapter for instructions on using these databases.
Download the latest NIC driver	Download and install the latest NIC driver from: http://www.3com.com/
Run the *Clean Up Failed Installation* program	The *Clean Up Failed Installation* program is located on the *EtherCD*. See "Cleaning Up a Failed Installation" earlier in this chapter for instructions.

Troubleshooting Remote Wake-Up

If your PC does not boot in response to a Remote Wake-Up event, perform these troubleshooting steps:

1 **Make sure that the PC meets the Remote Wake-Up requirements listed in Chapter 1.**

2 **Make sure that you are using the latest driver for the NIC.**

This driver is shipped with the NIC on the *EtherCD*. It can also be downloaded from:

http://www.3com.com/

3 **Perform the Remote Wake-Up Test.**

See "Running the NIC Diagnostics Tests" in Chapter 7 for instructions.

4 **Check the PC BIOS.**

a Boot the PC and enter the BIOS.

If you do not know how to enter the BIOS, consult the reference manual for your PC or contact your PC vendor.

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b Locate the Wake-Up on LAN event setting.

c Verify that the setting is enabled.

5 Check the Remote Wake-Up cable connection.

If you have a 3C905C-TX-M NIC and your PC is compliant with PCI 2.2, the Remote Wake-Up cable is not required. Remote Wake-Up is automatically enabled through the PCI bus.

a Turn off the power to the PC and remove the PC cover.

b Make sure that the Remote Wake-Up cable is plugged in to the RWU connector on the NIC and in to the appropriate connector on the PC motherboard. Unplug and reinsert the cable if necessary.

c Replace the Remote Wake-Up cable with a known functioning Remote Wake-Up cable and perform the Remote Wake-Up Test again.

6 If the previous steps have failed, install a known functioning Remote Wake-Up NIC in the PC.

If Remote Wake-Up works with the new NIC installed, contact your PC vendor for a replacement NIC.

If Remote Wake-Up does not work with the new NIC installed, there may be a problem with the PC motherboard. Contact your PC manufacturer.

Removing the Network Driver

To remove the EtherLink (3C90x) network driver from your PC, follow the steps for your operating system.

Windows 95 and Windows 98

To remove the network driver:

1 Double-click the My Computer icon, then the Control Panel icon, and then the System icon.

2 Click the Device Manager tab.

3 Double-click *Network adapters*.

4 Highlight the name of the NIC.

5 Click *Remove*.

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6 **Click *OK* to confirm the device removal.**

You are prompted to restart the PC.

If you are physically removing the NIC from the PC, click *No*. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

If you are reinstalling the NIC software, click *Yes* to restart the PC.

Windows NT 4.0

To remove the network driver:

1 **Double-click the My Computer icon, then the Control Panel icon, and then the Network icon.**

The Network screen appears.

2 **Click the Adapters tab.**

3 **Highlight the name of the NIC in the Network Adapters box, and then click *Remove*.**

4 **Click *Yes* to confirm the removal.**

5 **Click *Close* to close the Network screen.**

You are prompted to restart the PC.

If you are physically removing the NIC from the PC, click *No*. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

If you are reinstalling the NIC software, click *Yes* to restart the PC.

Windows NT 3.51

To remove the network driver:

1 **In the Main program window, double-click the Control Panel icon, and then double-click the Network icon.**

The Network Settings window appears.

2 **In the Installed Adapter Cards panel, select the name of the installed NIC, and then click *Remove*.**

A warning message appears.

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3 **Click *Yes* to confirm the removal.**

The Network Settings window appears. The NIC no longer appears in the Installed Adapter Cards panel.

4 **Click *OK*.**

The NIC driver and software are removed from the PC. You are prompted to restart the PC.

If you are physically removing the NIC from the PC, click *Don't Restart Now*. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

If you are reinstalling the NIC software, click *Restart Now* to restart the PC.

Removing the 3Com NIC Diagnostics Program

To remove the 3Com NIC Diagnostics program:

1 **Start Windows.**

2 **Insert the *EtherCD* in the CD-ROM drive.**

The *EtherCD* Welcome screen appears.

If the *EtherCD* Welcome screen does not appear, enter the following command from the Run option of the Windows Start menu:

```
d:\installs\setup.exe
```

where d:\ represents the letter name of the CD-ROM drive.

3 **Click *NIC Drivers*.**

4 **Click *Utilities*.**

5 **Click *Remove Diagnostics*.**

6 **Follow the prompts on the screen.**

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7 RUNNING NIC DIAGNOSTICS

Overview

This chapter explains how to:

- Interpret the NIC LEDs.
- Run the NIC diagnostic tests.
- View network statistics.
- Use the 3Com icon in the Windows system tray.

Interpreting the LEDs

The EtherLink PCI NICs have light-emitting diodes (LEDs), as described in the following table, that can assist with network troubleshooting.

Some LNK LED states do not apply to the AUI, BNC, SC, and ST connectors, as indicated by *N/A* in the table.

			Connector				
LED	**State**	**Meaning**	**RJ-45**	**AUI**	**BNC**	**SC**	**ST**
10 LNK (link)	On	If drivers are installed, the 10BASE-T connection is active.	Yes	N/A	N/A	N/A	Yes
		If drivers are not installed, the NIC is receiving power.	Yes	Yes	Yes	N/A	Yes
	Off	Something is preventing the connection between the NIC and the hub or switch.	Yes	N/A	N/A	N/A	Yes
	Blinking	The cable polarity is reversed. Try a different network cable or contact your system administrator.	Yes	N/A	N/A	N/A	N/A

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LED	State	Meaning	Connector				
			RJ-45	AUI	BNC	SC	ST
100 LNK (link)	On	If drivers are installed, the 100BASE-TX or 100BASE-FX connection is active.	Yes	N/A	N/A	Yes	N/A
		If drivers are not installed, the NIC is receiving power.	Yes	Yes	Yes	Yes	N/A
	Off	Something is preventing the connection between the NIC and the hub or switch.	Yes	N/A	N/A	Yes	
	Blinking	The cable polarity is reversed. Try a different network cable or contact your system administrator.	Yes	N/A	N/A	N/A	N/A
ACT (activity)	Blinking	Network traffic is present.	Yes	Yes	Yes	Yes	Yes
	Steady	Heavy network traffic is present.	Yes	Yes	Yes	Yes	Yes
	Off	No network traffic is present.	Yes	Yes	Yes	Yes	Yes

If a LNK LED indicates a problem, check the following:

1 **Ensure that your network hub or switch and the cable connecting to your NIC comply with the specifications appropriate for your network connection.**

2 **Ensure that the hub or switch is powered on.**

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Running the NIC Diagnostics Tests

The 3Com NIC Diagnostics program for Windows contains tests that can check the status of the following items:

- Network
- NIC
- Remote Wake-Up

To run NIC diagnostic tests on a PC running DOS, Windows NT 3.51, Windows 3.x, or Windows for Workgroups, use the 3Com Configuration and Diagnostics program for DOS. see the DOSDIAG.TXT file located in the HELP directory on the EtherCD *for instructions.*

To run the NIC Test, Network Test, or Remote Wake-Up Test:

1. **Make sure that the NIC, the network driver, and the 3Com NIC Diagnostics program are installed.**
2. **Open the Windows *Start* menu.**
3. **Select *Programs*, and then *3Com NIC Utilities.***
4. **Click *3Com NIC Doctor.***

   The 3Com NIC Diagnostics General screen appears.

Click Help to obtain general information about the function of a screen. To obtain specific information about any topic on a screen, click the question mark (?) in the upper right corner of the screen, move it over a topic, and click once.

5. **Click the Diagnostics tab.**

   The Diagnostics screen appears.

If the Run Remote Wake-Up Test button appears dimmed, the NIC that is installed in the PC does not support Remote Wake-Up.

To Run the Network Test

Run the Network Test to check the NIC connectivity to the network.

1. **Click *Run Network Test* on the Diagnostics screen.**

   The Network Connectivity Test screen appears.

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2 **Click *Start*.**

If the test passes, the NIC connection to the network is functioning correctly.

If the test fails:

Make sure that the NIC is properly connected to the network cable.

Make sure that the hub or switch to which the NIC is connected is powered on.

Make sure that the cable complies with the proper length and specifications for your network.

3 **Click *Close*.**

To Run the NIC Test

Run the NIC Test to check the physical components, connectors, and circuitry on the NIC.

1 **Click *Run NIC Test* on the Diagnostics screen.**

The NIC Test screen appears.

2 **Click *Perform NIC Test*.**

While the test is running, a progress bar indicates test progress.

If the test passes, the NIC is functioning correctly.

If the test fails, a message indicates the error type. Click *Help* in the error message screen to obtain more information.

3 **Click *Close*.**

To Run the Remote Wake-Up Test

At least two PCs on your network must contain a 3Com NIC with *EtherDisk* 4.x or later software to run the Remote Wake-Up Test.

1 **Click *Run Remote Wake-Up Test* on the Diagnostics screen.**

If the Run Remote Wake-Up Test button appears dimmed, the NIC does not support Remote Wake-Up.

The Remote Wake-Up Test screen appears.

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2 **Enter the number of seconds in the Seconds Until Wakeup entry box that the PC remains shut down until it receives a Wake-Up packet from the first PC.**

3 **Click *Test Remote Wake-Up.***

The PC shuts down.

If the PC automatically powers on after the number of seconds specified in the Seconds Until Wakeup entry box, Remote Wake-Up is functioning correctly.

If the PC does not power on, Remote Wake-Up is not functioning. See "Troubleshooting Remote Wake-Up" in Chapter 6 for more help.

Viewing Network Statistics

To view statistical information about the network:

1 **Make sure that the NIC, the network driver, and the 3Com NIC Diagnostics program are installed.**

2 **Open the Windows *Start* menu.**

3 **Select *Programs*, and then *3Com NIC Utilities.***

4 **Click *3Com NIC Doctor.***

The 3Com NIC Diagnostics General screen appears.

5 **Click the Statistics tab.**

The Statistics screen appears.

The information is updated by the NIC driver every 5 seconds.

For a description of each statistic, click the question mark (?) in the upper right corner of the screen, drag it over a statistic and click once. A pop-up box appears, displaying information about the statistic.

6 **Click *OK* to exit the diagnostics program. To go to another diagnostics screen, click the associated tab.**

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Using the 3Com Icon in the Windows System Tray

If the 3Com icon is visible in the Windows system tray, double-click the icon to start the 3Com NIC Diagnostics program.

If a red circle with a line through it appears over the 3Com icon, there is no connection between the NIC and the network. See "Troubleshooting the Network Connection" in Chapter 6 for help.

To show the 3Com icon in the Windows system tray:

1. **Make sure that the NIC, the network driver, and the 3Com NIC Diagnostics program are installed.**
2. **Open the Windows *Start* menu.**
3. **Select *Programs*, and then *3Com NIC Utilities.***
4. **Click *3Com NIC Doctor.***

   The 3Com NIC Diagnostics General screen appears.
5. **On the General screen, select the check box next to *Show Icon in System Tray*.**
6. **Close the 3Com NIC Diagnostic program.**

   When you drag your mouse pointer over the 3Com icon (but do not double-click the icon) a network statistics box appears, displaying the following information:

   Frames Sent and Received — A count of the number of frames (packets) sent and received through the NIC since the last time statistics were reset.

   Link Speed — The speed (10 Mbps or 100 Mbps) at which the NIC is connected to the network.

   The information is updated each time you move your mouse pointer over the 3Com icon.

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A SPECIFICATIONS AND CABLING REQUIREMENTS

This appendix lists the specifications, standards conformance, cable requirements, and connector pin assignments for the EtherLink PCI NICs.

3C905C-TX-M NIC Specifications

Hardware

Bus interface	*PCI Local Bus Specification, Revision 2.2*
	32-bit bus
PCI master	Supports bus master scatter-gather DMAs.
Dimensions	Height: 7.62 cm (3.00 in)
	Length: 14.86 cm (5.85 in)
Power requirement	+5 V ±5% @ 650 mA maximum

Network Interface

10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 Mbps baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-TX	Ethernet IEEE 802.3u industry standard for a 100 Mbps baseband CSMA/CD local area network

Environment

Operating temperature	32° to 158° F (0° to 70° C)
Storage temperature	–22° to 194° F (–30° to 90° C)
Operating humidity	10 to 90% noncondensing
Storage humidity	10 to 90% noncondensing
Altitude	–984 ft to 9,840 ft (–300 to 3,000 m)

Standards Conformance

IEEE 802.3 10BASE-T

IEEE 802.3u 100BASE-TX

IEEE 802.3x Full Duplex auto-negotiation and flow control

NWay 10/100 auto-negotiation

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IEEE 802.1p/Q

IEEE 802.1Q VLAN Tagging

RMON

Microsoft PC97

Microsoft PC98

Microsoft PC99

Net PC

PCI 2.2

DMI 2.0 and 2.0s

ACPI 1.0

Wired for Management 1.1a, 2.0

Pre-OS boot protocol support (PXE, BootP/DHCP, NCP, RPL)

3C905B NICs Specifications

Hardware

Bus interface	*PCI Local Bus Specification, Revision 2.1*
	32-bit bus
PCI master	Supports bus master scatter-gather DMAs.
Dimensions	**-TX, -TX-M, -TX-NM:**
	Height: 8.57 cm (3.57 in)
	Length: 12.07 cm (4.75 in)
	-COMBO
	Height: 10.033 cm (3.950 in)
	Length: 17.459 cm (6.874 in)
	-FX
	Height: 9.53cm (3.75 in)
	Length: 12.07cm (4.75 in)
Power requirement	+5 V ±5% @ 650 mA maximum

Network Interface

10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 Mbps baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-TX	Ethernet IEEE 802.3u industry standard for a 100 Mbps baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-FX	Ethernet IEEE 802.3q industry standard for 100BASE-FX

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Environment

Operating temperature	32˚ to 158˚ F (0˚ to 70˚ C)
Storage temperature	–22˚ to 194˚ F (–30˚ to 90˚ C)
Operating humidity	10 to 90% noncondensing
Storage humidity	10 to 90% noncondensing
Altitude	–984 ft to 9,840 ft (–300 to 3,000 m)

Standards Conformance

IEEE 803.3x flow control

Microsoft PC98

PCI 2.1

DMI 1.0 and 2.0

3C900B NICs Specifications

Hardware

Memory	4 KB internal RAM
Bus interface	*PCI Local Bus Specification, Revision 2.1*
	32-bit bus
PCI master	Supports bus master scatter-gather DMAs.
Dimensions	**-TPO**
	Height: 3.00 in/7.62 cm
	Length: 4.80 in/12.19 cm
	-COMBO
	Height: 3.95 in/10.03 cm
	Length: 6.82 in/17.32 cm
	-FL
	Height: 9.53cm (3.75 in)
	Length: 12.07cm (4.75 in)
Power requirement	+5 V ±5% @ 650 mA maximum

Network Interface

10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 MBPS baseband CSMA/CD local area network.

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Environment

Operating temperature	32° to 158° F (0° to 70° C)
Storage temperature	–22° to 194° F (–30° to 90° C)
Operating humidity	10 to 90% noncondensing
Storage humidity	10 to 90% noncondensing
Altitude	–984 ft to 9,840 ft (–300 to 3,000 m)

Standards Conformance

IEEE 803.3x flow control

Microsoft PC98

PCI 2.1

DMI 1.0 and 2.0

Cabling Requirements

The cable, quality, distance, and connectors must comply with the Electronic Industries Association/Telecommunications Industries Association (EIA/TIA) 568 *Commercial Building Wiring Standard* and the Technical Services Bulletin TSB38 standards.

Twisted-Pair Cable

Twisted-pair cable consists of copper wires surrounded by an insulator. Two wires are twisted together (the twisting prevents interference problems) to form a pair, and the pair forms a circuit that can transmit data. A cable is a bundle of one or more twisted pairs surrounded by an insulator.

Unshielded twisted pair (UTP) is the most commonly used type of twisted-pair cable. Shielded twisted pair (STP) provides protection against crosstalk. Twisted-pair cable is now commonly used in Ethernet, Fast Ethernet, and other network topologies.

The EIA/TIA defines five categories of unshielded twisted-pair cable.

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Category	Use
1	Traditional telephone cable.
2	Data transmissions up to 4 MHz.
3	Voice and data transmission up to 25 MHz. The cable typically has four pairs of wires. Category 3 is the most common type of installed cable found in older corporate wiring schemes.
4	Voice and data transmission up to 33 MHz. The cable normally has four pairs of wire. This grade of UTP is not common.
5	Voice and data transmission up to 125 MHz. The cable normally has four pairs of copper wire and three twists per foot. Category 5 UTP is the most popular cable used in new installations today.

10BASE-T Operation

10BASE-T is the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standard for Ethernet signaling over unshielded twisted-pair wire at 10 Mbps.

Ethernet, as the most widely used network protocol, uses 10BASE-T as its primary cabling scheme. Ethernet characteristics include:

- A data rate of 10 Mbps.
- A broadcast architecture.
- A specific media-access control (MAC) scheme.

The 10BASE-T name indicates a signaling speed of 10 Mbps and twisted-pair wiring. *Base* stands for baseband, which denotes a technique for transmitting signals as direct-current pulses rather than modulating them onto separate carrier frequencies.

A wiring topology using 10BASE-T specifies a wiring hub, cable arranged in a star configuration, and unshielded twisted-pair cable. Each node has a separate cable run that must not exceed 100 meters (328 ft) from the node to the hub.

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100BASE-TX Operation

100BASE-TX is the IEEE 802.3u standard for Fast Ethernet signaling over Category 5 UTP or STP wire at 100 Mbps.

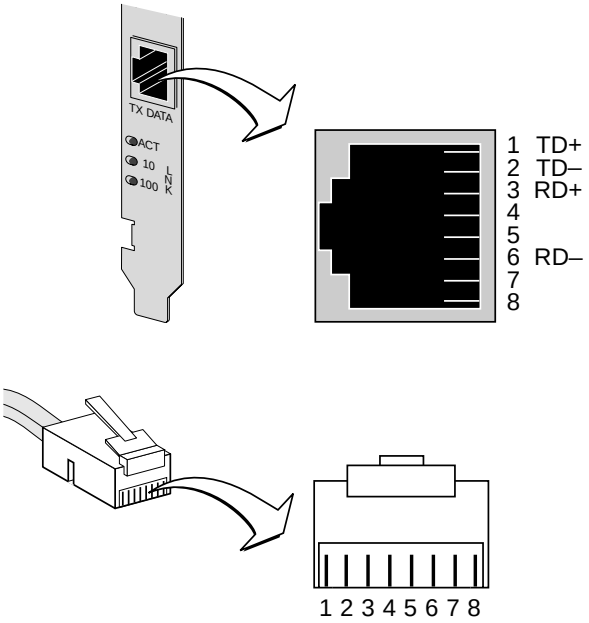
Based on an extension to the IEEE 802.3 Ethernet specification, Fast Ethernet characteristics include:

- A data rate of 100 Mbps.
- A broadcast architecture.
- A specific media-access control (MAC) scheme.

A wiring topology using 100BASE-TX specifies a wiring hub, cable arranged in a star configuration, and Category 5 UTP or STP wiring. Each node has a separate cable run that must not exceed 100 meters (328 ft) from the node to the hub.

RJ-45 Connector Pin Assignments

The following illustration shows the RJ-45 connector pin assignments for the EtherLink PCI NICs.



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B INSTALLING THE DYNAMIC*Access* LAN AGENT

Overview

This chapter explains how to install and configure the Dynamic*Access* LAN agent on a PC running Windows 95, Windows 98, or Windows NT.

For an overview of the DynamicAccess LAN agent, see "DynamicAccess LAN Agent" in Chapter 1. For detailed information on using, configuring, and troubleshooting the DynamicAccess LAN agent, access the DynamicAccess Technology User Guide *on the* EtherCD*. You can also download it from:*

http://www.3com.com/dynamicaccess

Client PC Requirements

The Dynamic*Access* LAN agent can be installed on a PC running Windows 95, Windows 98, Windows NT 4.0, or Windows NT 3.51.

CAUTION: *If you plan to install the DynamicAccess LAN agent on a multiprocessor PC running Windows NT 4.0, Service Pack 4, you must first download and install the appropriate Microsoft patch available at:.*

http://www.3com.com/dynamicaccess/hotfixes

Failure to install the patch will result in system failure.

The following table lists the minimum client requirements and recommended Microsoft Service Packs (if any) for the version of the Dynamic*Access* LAN agent that is included on the *EtherCD*.

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Operating System	PC Requirements	Recommended Microsoft Service Pack
Windows 95	486/75 MHz CPU 16 MB RAM (32 MB recommended) 5 MB available hard drive space	Windows 95 OSR2 or Service Pack 1
Windows 98	486/75 MHz CPU 16 MB RAM (32 MB recommended) 5 MB available hard drive space	None
Windows NT 4.0	Pentium/100 MHz CPU 32 MB RAM 5 MB available hard drive space	Service Pack 3
Windows NT 3.51	Pentium/100 MHz CPU 32 MB RAM 5 MB available hard drive space	Service Pack 5

Installing the Dynamic*Access* LAN Agent

To install the Dynamic*Access* LAN agent:

1. **Make sure that the NIC and the network driver are installed on your PC.**

   See "Verifying Successful Installation" in Chapter 3 to confirm that the NIC is properly installed in the PC.

2. **Start Windows.**

3. **Insert the *EtherCD* in the CD-ROM drive.**

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from Run option of the Windows Start menu:

   `d:\installs\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.

4. **Click *NIC Software*.**

5. **Click *Dynamic*Access *Technologies*.**

6. **Click *Dynamic*Access *LAN Agent*.**

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7 **Click *Install Dynamic*Access *LAN Agent Now.***

8 **Exit the *EtherCD*, and then exit Windows.**

9 **Restart the PC.**

You must restart the PC to complete the installation.

Verifying Successful Installation

After the Dynamic*Access* LAN agent is installed, the following changes are visible in the Windows Network control panel:

- For each physical NIC installed in the PC, a virtual NIC entry appears in the list of network adapters.

  All protocols are re-bound to the virtual NIC. The bindings to the physical NIC are still intact.
- A 3Com Dynamic*Access* LAN agent entry appears as a protocol.
- A 3Com Dynamic*Access* LAN agent icon is installed in the Windows Control Panel.

Configuring the Dynamic*Access* LAN Agent

Contact your system administrator about using Dynamic*Access* technology at your site.

The DynamicAccess LAN agent configuration instructions are intended for network administrators who have experience installing software and using management tools for an Ethernet network.

The instructions in this section are for configuring the Dynamic*Access* LAN agent on a local PC. You can obtain the complete configuration instructions by accessing the Dynamic*Access* Software User Guide on the *EtherCD.*

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To configure the Dynamic*Access* LAN agent on a local PC:

1 **Double-click the 3Com Dynamic*Access* icon in the Windows Control Panel.**

The Traffic Prioritization tab of the Dynamic*Access* Setup screen appears.

2 **Select the tab containing the information you want to configure.**

Traffic Prioritization — Allows you to prioritize applications, which can ease bottlenecks in your network and allow critical applications to take network precedence.

Fast IP — Allows you to enable and configure Fast IP.

Administration — Allows you to set Dynamic*Access* control panel access, set VLAN options, enable efficient multicast control, and enable the prioritizing of traffic.

For specific instructions on configuring any of the DynamicAccess technology options, click Help on the 3Com DynamicAccess screen or go to:

http://www.3com.com/dynamicaccess

Removing Dynamic*Access* Technology

For instructions on removing the Dynamic*Access* LAN agent from your PC, see the *DynamicAccess Software User Guide*. This user guide can be accessed on the *EtherCD* or it can be downloaded from:

http://www.3com.com/dynamicaccess

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C INSTALLING THE 3COM DMI AGENT

Overview

This appendix explains how to install the 3Com Desktop Management Interface (DMI) Agent on your PC.

The 3Com DMI Agent allows any DMI-compatible browser or network management application that supports DMI 2.0 to remotely manage and configure advanced features of an EtherLink PCI NIC.

For detailed information on the 3Com DMI Agent, see the 3Com DMI Agent User Guide *included with the 3Com DMI Agent software on the* EtherCD*.*

For more information on DMI, go to:

http://www.3com.com/managedpc

About the 3Com DMI Agent

The 3Com DMI Agent allows you to obtain basic NIC information, including:

- Node address
- MAC address
- Driver version

Additionally, depending on the features of your NIC, the 3Com DMI Agent allows you to view and configure advanced NIC features, including:

- Managed PC Boot Agent (MBA) software
- Remote Wake-Up events
- Workgroup keep-alive packet
- Remote system alerts (including heartbeat)

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Each PC that contains an EtherLink NIC and the 3Com DMI Agent generates a Management Information Format (MIF) file that contains information about the PC and the NIC. DMI applications use the information from the MIF to manage the PC and the NIC.

The content of the MIF is based on the capabilities of the NIC driver found in the PC. For example, if a NIC with an MBA boot ROM is found, all groups related to the boot ROM are included in the MIF for that particular NIC. This ensures that the network management application does not receive irrelevant information for the NIC.

For a description of each MIF that is supported by the 3Com DMI Agent, see the *3Com DMI Agent User Guide* included with the 3Com DMI Agent software on the *EtherCD.*

System Requirements

This section lists the client PC and network management requirements for installing and using the 3Com DMI Agent.

Client PC Requirements

Your PC requires the following items to use the 3Com DMI Agent:

- DMI Service Provider 2.0 or greater (such as Smart Technologies Service Provider 2.0)
- NDIS 3, 4, or 5 driver
- Windows 95, Windows 98, or Windows NT, using the appropriate Service Pack listed below:
  - Windows 95 Retail Service Pack 1 or OEM Service Release (OSR2)
  - Windows 98 Retail Release
  - Windows NT 4.0 Service Pack 3 or 4
  - Windows NT 3.51 Service Pack 5

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Network Management Requirements

Your network management station requires a DMI-compatible browser or a network management application that supports DMI 2.0, such as:

- Hewlett Packard TopTools
- Tivoli Management Suite
- Dell OpenManage
- Compaq Insight Manager Management Station
- Intel LANDesk Client Manager

Installing the 3Com DMI Agent

This section describes how to install the 3Com DMI Agent on a PC running Windows 95, Windows 98, or Windows NT 4.0.

For instructions on how to install the 3Com DMI Agent on a PC running Windows NT 3.51, see the *3Com DMI User Guide* included with the 3Com DMI Agent software on the *EtherCD*.

Before installing the DMI Agent, logon to the PC with an account that has system administration privileges.

To install the 3Com DMI Agent:

1. **Make sure that the PC meets the requirements listed in "Client PC Requirements" earlier in this chapter.**
2. **Make sure that the EtherLink NIC is installed in the PC and is connected to the network.**
3. **Insert the *EtherCD* in the CD-ROM drive.**

   The *EtherCD* Welcome screen appears.

   If the *EtherCD* Welcome screen does not appear, enter the following command from Run option of the Windows Start menu:

   `d:\setup.exe`

   where d:\ represents the letter name of the CD-ROM drive.

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4 **Click *NIC Software*.**

5 **Click *Dynamic*Access *Technologies*.**

6 **Click *3Com DMI Agent*.**

7 **Follow the prompts on the screen.**

8 **Restart the PC when prompted.**

To verify successful installation, use a DMI-compatible browser or a network management application that supports DMI 2.0 or 2.0s to verify that the 3Com NIC is present. See the *3Com DMI Agent User Guide* or contact your system administrator for instructions.

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D TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the most recent information, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com Knowledgebase Web Services
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3Com Facts℠ Automated Fax Service

World Wide Web Site

To access the latest networking information on the 3Com Corporation World Wide Web site enter this URL into your Internet browser:

http://www.3com.com/

This service provides access to online support information such as technical documentation and a software library, as well as support options that range from technical education to maintenance and professional services.

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3Com Knowledgebase Web Services

This interactive tool contains technical product information compiled by 3Com expert technical engineers around the globe. Located on the World Wide Web at **http://knowledgebase.3com.com**, this service gives all 3Com customers and partners complementary, round-the-clock access to technical information on most 3Com products.

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: **ftp.3com.com**
- Username: **anonymous**
- Password: **<your Internet e-mail address>**

You do not need a user name and password with Web browser software such as Netscape Navigator and Internet Explorer.

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 28,800 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601

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Country	Data Rate	Telephone Number
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 5977 7977
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 53,333 bps	1 847 262 6000

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 64 Kbps. To access the 3Com BBS using ISDN, call the following number:

1 847 262 6000

3Com Facts Automated Fax Service

The 3Com Facts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3Com Facts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If you require additional assistance, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

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Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, 3Com offers technical telephone support services. To find out more about your support options, call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

Here is a list of worldwide technical telephone support numbers:

Country	Telephone Number
Asia Pacific Rim	
Australia	1 800 678 515
Hong Kong	800 933 486
India	+61 2 9937 5085
Indonesia	001 800 61 009
Japan	0031 61 6439
Malaysia	1800 801 777
New Zealand	0800 446 398
Pakistan	+61 2 9937 5085
Philippines	1235 61 266 2602
P.R. of China	10800 61 00137 or 021 6350 1590
Singapore	800 6161 463
S. Korea	
From anywhere in S. Korea:	00798 611 2230
From Seoul:	(0)2 3455 6455
Taiwan, R.O.C.	0080 611 261
Thailand	001 800 611 2000
Europe	
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INDEX

Numbers

10 LNK LED
  picture of 13, 15
  troubleshooting with 73
100 LNK LED
  picture of 13
  troubleshooting with 74
100BASE-FX
  cable requirements 33
  link LED 74
100BASE-TX
  cable requirements 30
  link LED 13, 74
  operation 84
10BASE2
  cable requirements 31
  link LED 74
10BASE5
  cable requirements 32
  link LED 74
10BASE-FL
  cable requirements 34
  link LED 15
10BASE-T
  cable requirements 30
  link LED 13, 15, 73
  operation 83
3C900 NIC, installing in Windows 98 22
3C900B-COMBO NIC
  features 16
  picture of 15
  specifications 81
3C900B-FL NIC
  features 16
  picture of 15
  specifications 81
3C900B-TPO NIC
  features 16
  picture of 15
  specifications 81
3C905 NIC, installing in WIndows 98 22
3C905B-COMBO NIC
  features 14
  picture of 14
  specifications 80
3C905B-FX NIC
  features 14
  picture of 14
  specifications 80
3C905B-TX NIC
  features 14
  picture of 13
  specifications 80
3C905B-TX-M NIC
  features 14
  picture of 13
  specifications 80
3C905B-TX-NM NIC
  features 14
  picture of 13
  specifications 80
3C905C-TX-M NIC
  features 12
  picture of 11
  specifications 79
3C90X.LAN file 51
3Com bulletin board service (3Com BBS) 94
3Com Configuration and Diagnostics Program for DOS 59
3Com DMI Agent
  client PC requirements 90
  installing 91
  network management requirements 91
  overview 89
3Com icon, in Windows system tray
  removing 78
  showing 78
3Com Knowledgebase Web Services 94
3Com NIC Diagnostics program
  installing 44
  starting 58
3Com support services, accessing 65
3Com URL 93

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3ComFacts 95
50-ohm terminator 31

A

accessing Help 66
ACT (activity) LED
  picture of 12
  troubleshooting with 74
activity on the network, verifying 77, 78
alerts, remote system
  overview 20
  requirements 20
AUI port
  connecting to network 32
  specifications 32
AUTOEXEC.NCF file 55

B

BNC port
  connecting to network 31
  specifications 31
boot ROM, MBA
  booting from network 61
  default setting 58
  enabling or disabling 61
  overview 18
bulletin board service 94

C

cabling
  fiber-optic 33, 34
  Remote Wake-Up 17
  requirements 82
  specifications
    AUI port 32
    BNC port 31
    RJ-45 port 30
    SC port 33
    ST port 34
  thick Ethernet coaxial 32
  thin Ethernet coaxial 31
  troubleshooting 68
  unshielded twisted-pair (UTP) 30
carrier sense lost, viewing 77
cleaning up a failed installation 67
client driver, Novell NetWare 49
coaxial cable
  thick 32
  thin 31
collisions, viewing 77
compliance, Year 2000 10
configuring
  Dynamic*Access* LAN agent 87
  Managed PC Boot Agent (MBA) 60
  NIC 59
conventions
  text, About This Guide 10
CRC errors, viewing 77

D

Desktop Management Interface (DMI), overview 19
diagnostics tests, running 75
diskettes
  creating 23
  obtaining 22
DMI (Desktop Management Interface), overview 19
DOS
  3Com Configuration and Diagnostics Program 59
  Novell client driver, installing 49
drivers
  NetWare client, installing 49
  NetWare server, installing 51
  Windows 95, installing 38
  Windows 98, installing 39, 43
  Windows NT
    version 3.51, installing 42
    version 4.0, installing 41
duplex mode
  configuring 59
  default setting 57
Dynamic*Access* LAN agent
  administration 88
  client requirements 85
  configuring 87
  efficient multicast control 20
  Fast IP 20
  features 19
  Help, accessing 88
  installing 86
  overview 19
  removing 88
  traffic prioritization 20
  verifying installation 87

Downloaded from www.Manualslib.com manuals search engine

E

efficient multicast control
- configuring 88
- overview 20

EIA/TIA 568 standards 82
Ethernet cable
- fiber-optic 33, 34
- thick coaxial 32
- thin coaxial 31

Ethernet protocol, characteristics of 83
excessive collisions, viewing 77
external transceiver 32

F

Fast Ethernet protocol, characteristics of 84
Fast IP
- configuring 88
- overview 20

fax service (3ComFacts) 95
fiber-optic cable 33, 34
frame alignment errors, viewing 77
frames, sent and received, viewing 78
frequently asked questions 66
full-duplex 57

H

half-duplex 57
Help system, accessing 66

I

installation
- 3Com DMI Agent 91
- connecting to the network 29
- diskettes
  - creating 23
  - obtaining 22
- Dynamic*Access* LAN agent 86
- multiple NICs 45, 53
- overview 21
- preinstallation program, running 24
- Remote Wake-Up cable 28
- verifying 43

installation steps 21
installing drivers
- NetWare client for DOS, Windows 3.1x, and Windows for Workgroups 49
- NetWare server 51
- Windows 95 38
- Windows 98 39
- Windows NT 3.51 42
- Windows NT 4.0 41

installing multiple NICs
- NetWare server 53
- Windows 95 45
- Windows 98 45
- Windows NT 4.0 47

intelligent auto install software
- requirements 50
- running 50
- using 49

K

keep-alive packet, workgroup 20
Knowledgebase topics
- accessing through diagnostics program 66
- accessing through Web site 65

L

late collisions, viewing 77
LEDs
- description 73
- picture of 11, 13, 15
- troubleshooting 74

link speed, checking 78

M

Managed PC Boot Agent (MBA) software
- configuring 60
- network booting 61
- overview 18

media type
- configuring 59
- default setting 58

MIBs 94
multiple collisions, viewing 77
multiple NIC installations
- NetWare server 53
- Windows 95/98 46
- Windows NT 4.0 47

Downloaded from www.Manualslib.com manuals search engine

N

NetWare
  NLMs 51
  server driver 51
Netware Loadable Modules (NLMs) 51
network
  activity, verifying 77, 78
  booting 61
  cable, maximum length 31, 32, 33, 34
  connecting to 29
  connection, testing 75
  statistics, viewing 77
  test, running 75
network connection, troubleshooting 68
network driver optimization
  configuring 59
  default setting 57
  description 57
network supplier support 95
NIC
  diagnostic tests 75
  driver installation 49
  software, removing 70
  test, running 76
Novell NetWare
  client driver 49
  multiple NICs 53
  server driver 51

O

online Help 66
online Knowledgebase 65
online technical services 93

P

packets, viewing 77, 78
PC requirements 21
PCI slot, identifying 26
pin assignments 84
preinstallation program, running 24

R

receive overruns, viewing 77
received frames, viewing 78
red X in Windows Device Manager 67
release notes, accessing 66
remote monitoring (RMON) 19
Remote Wake-Up
  cable
    connecting 28
    obtaining 17
  multiple NIC Installations 18
  overview 17
  requirements 17
  test, running 76
  troubleshooting 69
removing Dynamic*Access* LAN agent 88
removing NIC software 70
requirements
  3Com DMI Agent 90
  cabling 82
  Dynamic*Access* LAN agent 85
  PC 21
  Remote Wake-Up 17
returning products for repair 97
RJ-45 port
  connector pin assignments 84
RMON (remote monitoring) 19

S

SC (fiber) port
  connecting to network 33
  specifications 33, 34
sent frames, viewing 78
server driver, Novell NetWare 51
shielded twisted-pair (STP) cable 82
single collisions, viewing 77
software
  3Com NIC Diagnostics program, installing 44
  NetWare drivers, installing 49
  removing 70
  updating 45
  Windows network drivers, installing 37
specifications
  cabling
    AUI port 32
    BNC port 31
    RJ-45 port 30
    SC port 33
    ST port 34
specifications, NIC 79
SQE errors, viewing 77
statistics, network, viewing 77
STP wire 82
support databases, accessing 65

Downloaded from www.Manualslib.com manuals search engine

T

technical support
  3Com Knowledgebase Web Services 94
  3Com URL 93
  bulletin board service 94
  fax service 95
  network suppliers 95
  product repair 97
test
  Network 75
  NIC 76
  Remote Wake-Up 76
thick Ethernet coaxial cable 32
thin Ethernet coaxial cable 31
traffic prioritization
  configuring 88
  overview 20
transmit deferrals, viewing 77
transmit underruns, viewing 77
troubleshooting
  cable 68
  cleaning up a failed installation 67
  error messages 67
  LEDs 74
  MBA boot ROM 60
  network connection 68
  NIC installation 67
  Remote Wake-Up 69
twisted-pair cable, description 82

U

uninstalling the NIC 70
unshielded twisted-pair (UTP) cable 30, 82
updating
  network driver 45
  NIC diagnostic program 45
upgrading Windows 95 to Windows 98 22
URL 93

V

verifying successful installation 43

W

Windows 3.1x, Novell client driver, installing 49
Windows 95
  multiple NIC installations 46
  removing NIC software 70
  upgrading to Windows 98 22
  verifying installation 43
Windows 98
  installing driver (NDIS 5) 43
  multiple NIC installations 46
  removing NIC software 70
  upgrading from Windows 95 22
  verifying installation 43
Windows for Workgroups, Novell client driver, installing 49
Windows NT 3.51
  installing driver 42
  removing NIC software 71
  verifying installation 43
Windows NT 4.0
  installing driver 41
  multiple NIC installations 47
  removing NIC software 71
  verifying installation 43
Windows system tray, 3Com icon 78
workgroup keep-alive packet 20
World Wide Web (WWW) 93, 94

Y

Year 2000 compliance 10
yellow exclamation point (!) in Windows Device Manager 67

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5400 Bayfront Plaza
P.O. Box 58145
Santa Clara, CA 95052-8145
(408) 326-5000

FCC CLASS B STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1 This device may not cause harmful interference, and

2 This device must accept any interference received, including interference that may cause undesired operation.

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one which the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

Tested to comply with the FCC Standards for home and office use.

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We declare under our sole responsibility that the

Model:	Description:
3C905C-TX-M	EtherLink 10/100 PCI for Complete PC Management Network Interface Card
3C905B-TX	EtherLink 10/100 PCI Network Interface Card
3C905B-TX-M	EtherLink 10/100 PCI Network Interface Card
3C905B-TX-NM	EtherLink 10/100 PCI Network Interface Card
3C905B-COMBO	EtherLink 10/100 PCI Network Interface Card
3C905B-FX	EtherLink 100 PCI Fiber Network Interface Card
3C900B-TPO	EtherLink 10 PCI Network Interface Card
3C900B-COMBO	EtherLink 10 PCI Network Interface Card
3C900B-FL	EtherLink 10 PCI Fiber Network Interface Card

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- ANSI C63.4-1992 Methods of Measurement
- Federal Communications Commission 47 CFR Part 15, subpart B
  15.107 (e) Class B Conducted Limits
  15.109 (g) Class B Radiated Emissions Limits

3Com Corporation, 5400 Bayfront Plaza, P.O. Box 58145, Santa Clara, CA 95052-8145
(408) 326-5000

Industry Canada Class B Emission Compliance Statement

This Class B digital apparatus complies with Canadian ICES-003.

Avis de Conformité à la Réglementation d'Industrie Canada

Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

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